2012-2013 Catalog Home

Although this catalog was prepared on the basis of the best information available at the time of publication, all information, including statements of tuition and fees, course offerings, and admission and graduation requirements, is subject to change without notice or obligation. The catalog is produced by the Office of the Provost and the Office of the University Registrar, in cooperation with university administration.

Archived Catalogs

All prior university catalogs are available on the web and may be accessed at http://registrar.gmu.edu/catalog-archives/.

Equal Opportunity and Nondiscrimination Policy

George Mason University is an equal opportunity/affirmative action institution. Please see University Policies 1201: Non-Discrimination Policy, 1202: Sexual Harassment Policy and 1203: Non-Discrimination and Reasonable Accommodations on the Basis of Disability, for a full statement of the university's Equal Opportunity and Nondiscrimination Policy.

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University’s Mission

George Mason University is innovative and entrepreneurial in spirit and uses its multi-campus organization and location near our nation's capital to attract outstanding faculty, staff, and students. George Mason will:

Educate the new generation of leaders for the 21st century—men and women capable of shaping a global community with vision, justice, and clarity.

Encourage freedom of thought, speech, and inquiry in a tolerant, respectful academic setting that values diversity.

Provide innovative and interdisciplinary undergraduate, graduate, and professional courses of study that enable students to exercise analytical and imaginative thinking and make well-founded ethical decisions.

Nurture and support a highly qualified and entrepreneurial faculty that is excellent at teaching, active in pure and applied research, capable of providing a broad range of intellectual and cultural insights, and is responsive to the needs of students and their communities.

Maintain an international reputation for superior education and public service that affirms its role as the intellectual and cultural nexus among Northern Virginia, the nation, and the world.

Vision for the 21st Century

George Mason University will be the university needed by a region and a world driven by new social, economic, and technological realities.

We are in the right place: The nation’s capital region is the epicenter of the world’s political web, its information and communications network, and its new economy.

We are ready: In an age that demands originality and imagination, Mason is among the nation’s most innovative universities.

Mason will

- Be a magnet for outstanding faculty who will devise new ways to approach problems, invent new ways to teach, and develop new knowledge for the benefit of the region and nation.
- Attract inventive, industrious students of all ages and cultures, and produce citizens who are intellectually and technologically literate—people who will lead by the force of their ideas.
- Transform into knowledge and wisdom the vast amounts of information now accessible through new technologies.
• Build strong alliances that bring the know-how of business and the community into the university and take the knowledge of the university into the workplace and the larger society.
• Be a center of inquiry, knowledge, and professional expertise in fields with vital implications for human needs and opportunities in the future.
• Remain innovative, resourceful, and responsive while drawing on the intellectual and cultural heritage of the classical university.

Alan G. Merten  
President, George Mason University  
1996 - 2012

George Mason, the Man
When George Mason (1725–92) wrote the Virginia Declaration of Rights in 1776, he gave America the noble concept that the rights of the individual must be protected against the power of government. By placing in Virginia’s first constitution a list of rights that could never be taken away from citizens, George Mason sought to ensure a society in which government could not become all-powerful.

As a result of his influence, the first 10 amendments, which we know as the Bill of Rights, were added to the U.S. Constitution. The universal significance of this action made the American Revolution much more than a war for independence from Great Britain; it enshrined in our most important public document the principle that a government must always respect the rights of the people.

George Mason, a slave owner, did not recognize that those rights extended to slaves. Nevertheless, his words were later used to demonstrate that slavery could not exist in a country that proclaimed its belief in human rights. While we as a country have not always adhered to George Mason’s great ideas, they remain the measure of the best in our national life.

University History
The idea for George Mason University was born in 1949 when the Northern Virginia University Center, essentially an adult-education extension of the University of Virginia at Charlottesville, opened under the direction of John Norville Gibson Finley. In 1955 and again in 1956, the Board of Visitors of the University of Virginia and Virginia legislature authorized the establishment of a two-year branch college to serve Northern Virginia.

The university’s formal history began in 1957 as University College, the Northern Virginia branch of the University of Virginia, offering courses in engineering and the liberal arts. It opened in a renovated elementary school in the Bailey’s Crossroads area with an enrollment of 17 students.

Eager to support the fledgling institution, the Town (now City) of Fairfax purchased 150 acres in 1958 and donated the land to the University of Virginia for a permanent branch campus. The following year, the University of Virginia Board of Visitors selected the name George Mason College. Construction of the campus’ first four buildings was completed in 1964. In September of that year, 356 students began their studies in the new classrooms.

In March 1966, the General Assembly authorized the expansion of George Mason College into a four-year, degree-granting institution and gave it the long-range mandate to expand into a major regional university. The first senior class received degrees in June 1968. Graduate programs began in September 1970, with the first master’s degrees conferred in June 1971. The George Mason College Board of Control, supported by citizens of the cities of Alexandria and Falls Church, and Arlington and Fairfax counties, acquired an additional 422 acres. By the end of 1970, the college’s Fairfax Campus reached 572 acres; it is now 677 acres.
In 1972, the Board of Visitors of the University of Virginia recommended that the college separate from its parent institution. On April 7 of that year, the governor signed the General Assembly legislation that established George Mason University as an independent member of Virginia’s system of colleges and universities.

Since 1972, the university’s development has been marked by rapid growth and innovative planning. In 40 years, enrollment has risen from 4,166 to more than 32,000 students. In 1979, Mason was given the authority to grant doctoral degrees and began offering programs at this level. In the same year, the university acquired what became George Mason University School of Law, located on the Arlington Campus.

In 1985, Mason partnered with area businesses to develop an engineering program geared toward the emerging information technology field and started what is now the Volgenau School of Engineering. With the Volgenau School, Mason was the first institution in the country to offer a doctoral degree in information technology.

The establishment in 1990 of the Institute of the Arts, which became the College of Visual and Performing Arts in 2001, solidified the university’s commitment to make the arts an integral part of students’ lives. The Center for the Arts and the arts complex, which includes art galleries, studio and rehearsal space, and performing venues such as Harris Theatre and TheaterSpace, are all components of the college.

On the Fairfax Campus, the innovative George W. Johnson Center was dedicated in April 1996. By combining student life resources with educational support facilities such as an interactive library, Mason created the learning workspace of the future. Educational administrators from around the world have toured the center.

The university’s facilities continue to grow. In 2006, the university opened its first facility dedicated to research, Research Hall, which contains an observatory and laboratories for a number of campus research centers. In 2009 the university opened the Long and Kimmy Nguyen Engineering Building, which is now the largest academic building on campus. In addition to being the university's first LEED-certified building on the Fairfax campus, the Nguyen Engineering Building is also the first in Virginia's public university system to offer corporate lease space. Also opening in 2009 was the Art and Design Building, which is now home to the School of Art.

Masonvale, a townhome community on campus that provides short-term housing for faculty and staff, opened in late 2009. The Hylton Performing Arts Center on the Prince William Campus celebrated its grand opening in May 2010 and the Mason Inn Conference Center and Hotel opened in summer 2010 on the Fairfax campus. On the Arlington campus, Founder's Hall was ready for occupation by the School of Public Policy and other units in early 2011.

The university’s growing reputation as an innovative educational leader is rooted in Virginia’s strong educational tradition. By emphasizing high technology, public policy, and the fine and performing arts, Mason has created a curriculum and mission to meet the needs of Northern Virginia’s extraordinary cosmopolitan constituency. The university has also achieved national distinction in many areas. Its reputation continues to grow as Mason provides educational, cultural, and economic resources for the people of Virginia, the nation, and the world.

Faculty and Students

The university’s more than 1,300 full-time instructional and research faculty members are experts in a broad range of fields. They have published widely, contributed to major research findings, and consulted with government and business officials. Drawing prominent scholars from all fields, Mason’s outstanding faculty have received grants and awards from the Guggenheim Foundation, the Templeton Foundation, the National Science Foundation, the National Endowment for the Arts, and the National Endowment for the Humanities; they have won numerous awards such as: Fulbright Scholar grants, Pulitzer Prizes, Mellon Fellowships, Institute of Electrical and Electronics Engineers Centennial Medals, and Nobel prizes. More than 30 endowed chairs at the university have also brought many internationally renowned artists and scholars to campus.

Of particular interest to undergraduates are the Robinson Professors, outstanding scholars in the liberal arts and sciences who have come to Mason from prestigious positions elsewhere. They are concerned with broad and fundamental intellectual issues and are dedicated to undergraduate teaching and working with Honors students. In 1984, the first Robinson Professors joined the faculty as the result of a generous bequest from the estate of Clarence J. Robinson.
The majority of the university’s more than 33,000 students are from Virginia; however, all 50 states and Washington, D.C., as well as 130 countries, are represented in the student body. While full-time undergraduates, 18 to 24 years in age, make up the largest student group, part-time graduate and undergraduate students account for nearly half of the student population. Mason welcomes qualified students with a wide range of interests and backgrounds.

**Distributed University - Regional Campuses**

Mason is a distributed university, with regional campuses in Fairfax, Arlington, and Prince William counties, and instructional sites in Loudoun County, Herndon, and Front Royal. Each Mason campus has a distinctive academic focus that plays a critical role in the economy of its surrounding region. At each campus, students and faculty have access to all the university’s resources, while the duplication of programs and support services is minimized through the use of technology.

**Fairfax Campus**

Situated on 677 acres of wooded land, the Fairfax Campus offers a wealth of opportunities beyond the numerous academic programs and is the principal center for undergraduate residence and life. The resident student population is expected to grow to more than 5,800 during the next five years as new residential units are constructed.

The George W. Johnson Center, the first building of its kind in the country, fosters university-wide learning by integrating students’ curricular and extracurricular activities and strengthening relationships among university communities.

The Center for the Arts and the Patriot Center offer numerous opportunities to experience the arts, as well as sports and other entertainment. Professional artistic events presented on campus include music and dance from around the world and regional, national, and international visual art exhibitions. Free tickets are available to these events for full-time Mason students.

The Aquatic and Fitness Center provides state-of-the-art exercise equipment and competitive and recreational swimming to the university community and outside teams. The 120,000 square foot Recreation and Athletic Complex (formerly the PE Building) boasts three gymnasiuems, two racquetball courts, two squash courts, and a two story fitness gallery. Additional equipment and exercise space is also available in Skyline Fitness, adjacent to the residence halls.

**Arlington Campus**

The Arlington Campus, established in 1979, is located near Washington, D.C., on 5.2 acres of land. Mason's most urban location, the Arlington Campus is situated conveniently in the Virginia Square neighborhood and offers easy access via Metro and key transportation routes. The Campus has a strong focus on professional and graduate training in law, public policy and conflict analysis and resolution. The Arlington Campus is home to the School of Law (SOL), the School of Public Policy (SPP) and the School for Conflict Analysis and Resolution (SCAR), as well as programs in nonprofit management, arts management, business administration, and education. The Volgenau School of Engineering (VSE) offers special certification courses in information technology through its TechAdvance Program through the Office of Continuing Professional Education (OCPE). Additional continuing and professional education classes are also available on site. While most of the programs offered on the Arlington Campus are on the graduate and professional levels, some undergraduate courses are available.

The Mercatus Center, the James M. Buchanan Center for Political Economy, and the Institute for Humane Studies—indepedent initiatives affiliated with the university—can also be found on the Arlington Campus. In addition, the campus houses the Center for Global Studies; Center for Justice, Law, and Society; Center for Critical Infrastructure and Homeland Security; Interdisciplinary Center for Economic Science; and Center for Regional Analysis.

Arlington's newest structure, which opened January 2011, is Founders Hall. Founders Hall provides 256,000 square feet of space for academic and student support services. In addition, the building features a 300-seat auditorium, a public plaza, a large multipurpose room, and three levels of underground parking (443 additional parking spaces). These new spaces will enable the university to highlight and showcase much of the exciting work taking place at the Arlington campus - as well as throughout the

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Prince William Campus

The Prince William Campus, established in 1997, resides on 134 acres in Manassas, near the intersection of I-66 and the Prince William Parkway. The campus serves all of Northern Virginia and offers convenient access to the university for citizens of Prince William, Fauquier, and western Fairfax counties; the cities of Manassas and Manassas Park; and adjoining areas to the west and south. A major focus of the campus is research and academic programs in the life sciences, including biodefense and infectious diseases, cancer proteomics, genomics, medical education and bioinformatics. Graduate studies in Advanced Biomedical Sciences are offered for students preparing for medical school or careers in health professions. Programs in nursing, teacher education, information technology, health and fitness, recreation, exercise science, health promotion, parks and outdoor recreation, sport management, therapeutic recreation, tourism and events management, and athletic training also are offered on the campus. Professional certificate programs are available through the Office of Continuing Professional Education.

Campus resources available to all university students, faculty, and staff include a full-service library, a large drop-in computer lab, an information center, University Police, a university bookstore, dining services, a student lounge, a shuttle bus service between the Fairfax and Prince William Campuses, and a full complement of student and academic services. In addition, there are numerous opportunities to get involved in campus life through a variety of co-curricular and extracurricular activities.

Many campus facilities and services are available to serve university and community needs. The 300-seat Verizon Auditorium boasts innovative audiovisual technologies suitable for presentations, meetings, and ceremonies, along with lobby space for receptions and displays.

The campus comprises six buildings: two research facilities, two academic buildings, a recreation and fitness center and a performing arts center. Graduate student housing with ground level retail space is scheduled to open in fall 2012. A third research facility also under construction is scheduled to open summer 2013. Through mutually beneficial partnerships with local government and area businesses, the campus has positioned itself to tap into the unique assets of the surrounding community while providing access to university resources and programs for students and citizens. The university’s Biomedical Research Laboratory (BRL) opened in 2010. This regional biocontainment facility is funded in part by the National Institute of Allergy and Infectious Diseases and houses research on emerging infectious diseases and those caused by biological threat agents.

The 110,000-square-foot Freedom Aquatic & Fitness CenterTM offers state-of-the-art exercise equipment, group fitness programs, a full gymnasium with elevated track, and recreational and instructional swimming in a 50-meter competition pool, classrooms, and other meeting spaces. It is also home to EDGE, Mason Center for Team and Organizational Learning's Challenge Course.

Prince William County, the City of Manassas, and Mason, along with the private sector, have joined to create the region’s first state-of-the-art performing arts center. The Hylton Performing Arts Center, opened in 2010, provides outstanding professional performances by artists from around the world in world-class venues. With resources for community arts groups; regional business, civic, and service organizations; county and city school students and teachers; Mason students and faculty, The Hylton Performing Arts Center educates, entertains, and enriches the community.

The Governor's School @ Innovation Park conducts classes at the Prince William campus, beginning fall 2010.

Instructional Sites

Mason in Loudoun connects students and businesses in one of the nation’s fastest-growing areas to one of the commonwealth’s premier universities. The goal of ‘Mason in Loudoun’ is to provide courses that will introduce the area's workforce and residents to study in a number of exciting areas, while offering current students a local option toward completion of degree program requirements. Located in leased space at 21641 Ridgetop Circle in Sterling, Virginia, ‘Mason in Loudoun’ offers course work in
nursing, health science, education, information technology, and management, along with undergraduate general education courses. Students enrolled in Loudoun enjoy the same rights, privileges, and access as those on Mason’s Fairfax, Arlington, and Prince William Campuses.

The Office of Continuing Professional Education’s Herndon Training Center, located off the Dulles Toll Road and Route 28 at the Center for Innovative Technology (CIT), provides a wide range of yearly open-enrollment seminars and workshops in its meeting facilities. CIT classrooms are fully electronic and include a groupware platform. The School of Management’s Executive MBA Program and the Volgenau School of Engineering’s TechAdvance Program are located here.

In partnership with the Smithsonian Institution, the University offers the Smithsonian-Mason School of Conservation (SMSC). Based at the Smithsonian Conservation Biology Institute (SCBI) in Front Royal, Virginia, the residential program offers two distinct 16-credit semester in conservation studies. Students work with prominent research scientists, educators, and conservation practitioners in a unique learning community complemented by state of the art academic and residential facilities. This unique program emphasizes active learning, teamwork, hands-on experience, public communication and case studies, preparing students for conservation-related professions and graduate study. SMSC also offers specialized graduate and professional training opportunities, all focused on themes related to biodiversity conservation, yet covering a diverse selection of topics.

Accreditation

George Mason University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award bachelor’s, master’s, and doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097 or call 404-679-4500 for questions about the accreditation of George Mason University.

Individual programs or units may also be accredited by discipline-specific agencies.

The university is a member of the Council of Graduate Schools in the United States.

George Mason University Foundation

Established in 1966, the George Mason University Foundation Inc. works to advance the aims and purposes of the university. It is a 501(c)(3) nonprofit foundation organized and operated exclusively for the benefit of the university.

The foundation assists Mason in generating private support and manages, invests, and administers private gifts, including endowment and real property. The foundation is governed by a volunteer Board of Trustees that is led by a chair. The foundation president and chief financial officer report to the Executive Committee of the Foundation Board and work with the vice president of development and alumni affairs to support the private resource needs of the university.
Admission

- Undergraduate Admission Policies
- Graduate Admission Policies
- Admission of International Students
- Non-degree Enrollment
- Academic Testing

Office of Admissions
4400 University Drive, MS 3A4
Fairfax, VA 22030
Phone: 703-993-2400
Fax: 703-993-4622
Web: admissions.gmu.edu

Undergraduate Admission Policies

Admission is competitive because the number of qualified candidates exceeds the number of new students who can be accommodated. Each candidate who presents sufficient admission qualifications is reviewed in the context of other qualified applicants. An offer of admission is valid only for the semester for which the student applied. Programs with limited space or special requirements may need a second review process for admission.

Applying for Admission

Application for undergraduate admission should be made to the Office of Admissions. Applications are available at admissions.gmu.edu/applynow. A nonrefundable and nontransferable fee must accompany the application.

Application Deadlines for Freshmen and Transfer Students

The application deadline for fall admission is January 15 for freshman applicants and March 1 for transfer applicants. The application deadline for the spring semester is October 1. Mason encourages early applications from prospective freshmen who wish to be considered for academic scholarships. Applications received after published deadlines will be considered on a space-available basis. The university reserves the right to close applications before published deadlines if conditions so warrant. Admission is contingent on satisfactory completion of in-progress course work and graduation from high school or community college, if relevant.

Early Admission

High school juniors who have completed high school graduation requirements except for senior English and government courses may, with the approval of their high school guidance counselor or principal, apply for admission and thereby enter the university as degree-seeking students one year early. Applicants should present exceptional grades, Scholastic Assessment Test (SAT) or American College Test (ACT) scores, and a high school course of study demonstrating rigorous academic preparation for university-level work. It is strongly recommended that candidates submit first semester junior year grades.

Freshman Requirements

The following factors are considered when reviewing freshman applications for admission:
- Cumulative high school grade point average (GPA) for course work completed in grades 9 through 12
- Level of difficulty of course work elected throughout the high school years, particularly in English, mathematics, laboratory science, social science, and foreign language
- Scores from SAT I or ACT (see exceptions under Score Optional Consideration below)
- For all non-native English speakers, scores from the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS) exam.
- Essay(s)
- List of extracurricular activities
- Teacher and guidance counselor recommendations

Fall semester applicants whose applications are complete by the application deadline are notified of decisions by April 1. All other applicants are notified on a space-available basis.

The following table specifies the minimum units of college preparatory work required for admission, as well as the minimum units recommended. The recommended units reflect the typical high school program of students who have succeeded in competing for admission in recent years.

In the following chart, column (1) refers to students applying for a bachelor of arts, excluding those in column (3), bachelor of fine arts, bachelor of music program, or with an undeclared major. Column (2) refers to students applying to a bachelor of science degree program, excluding those in column (3). Column (3) refers to applicants who intend to major in pre-business, chemistry, computer science, engineering, geology, mathematics, or physics. Note that one unit equals one academic year of study.

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<td>4</td>
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<td>3</td>
<td>4</td>
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<td>2</td>
<td>3</td>
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<td>Foreign Language</td>
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<td>Other Academic Electives</td>
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<td>5</td>
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<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

*Selected from algebra I, algebra II, geometry, trigonometry, analytic geometry, functions, math analysis, pre-calculus or calculus

**Selected from biology, chemistry, physics, or other advanced lab science

**Freshman Score Optional Consideration**

Score optional review provides an opportunity for applicants to be considered for admission without submitting or in disregard of standardized test scores. Admission to Mason remains a highly competitive process, and score optional candidates are considered on their own merits. **Qualifying for score optional review does not guarantee admission to Mason.** Qualifications for score optional consideration can be found at admissions.gmu.edu/scoreoptional.
Acceptance of Freshman Admission Offer

Mason complies with the national freshman candidate reply date of May 1. Students confirm by completing the enrollment confirmation online or on the form in the admission packet and submitting it to the university with an enrollment deposit. The deposit is nonrefundable after May 1.

Transfer Requirements

Students who have graduated from high school and subsequently attempted course work at a college or university are considered transfer applicants. Transfer admission is competitive and the number of applications received annually exceeds the available spaces in our transfer class. The Admissions Committee considers each transfer application individually and reviews all grades received in courses attempted, as well as the rigor of the applicant's academic program. Transfer applicants who have completed 45 or more credits are required to declare a specific major on the application to benefit from academic advising within their intended major. Transfer applicants must submit official transcripts from each previous college or university attended. Transfer applicants with fewer than 30 transferable credits must also submit an official high school transcript or secondary school leaving certificate and ACT or SAT scores. The Admissions Committee may request secondary school records or ACT/SAT results for some applicants who have earned more than 30 credits. All non-native English speakers are required to submit official results of the TOEFL with a minimum IBT score of 88 or the IELTS with a minimum academic score of 6.5. Completion of at least two English composition courses with grades of C or better in each course may be submitted in lieu of the TOEFL or IELTS exams. The English courses must be completed at a regionally accredited U.S. college or university and approved by the Office of Admissions.

Students on active academic or social suspension or dismissal are not eligible for admission.

Additional transfer admission requirements are located at admissions.gmu.edu/transfer/TransferAdmissionRequirements.asp.

Transfer Credit

Transfer students receive a formal evaluation of transfer credit from the Office of Admissions after admission and receipt of the enrollment deposit. The student is responsible for providing the Office of Admissions official final transcripts of all course work attempted at other colleges/universities. Transfer credit evaluations are considered final after the first academic year of enrollment.

Transfer credit is accepted from regionally accredited colleges and universities, provided that a grade of C or better has been earned in the course and the course content is equal to that offered at Mason. Note that only credits, not grades, are transferred; grades for transferred courses will not become part of a student’s GPA at Mason. Transfer credit is not granted for study in non-regionally accredited institutions. An exception may apply to Individualized Study, BIS majors, where college-level credit earned at institutions accredited by bodies other than recognized regional accrediting organizations (admissions.gmu.edu/transfer/TransferCreditAccredication.asp) is subject to approval by the BIS program director or dean. Course work from institutions not included in the admission application will not be eligible for transfer credit. George Mason University reserves the right to revoke admission, withhold the award of credit or disenroll students who fail to indicate all previous institutions attended on the admission application.

A minimum of 30 credits must be completed in residence at Mason and 45 credits of upper-level course work must be completed to qualify for graduation. While lower-level courses taken at previously attended institutions may meet the content requirement of upper-level courses, they do not reduce the 45-credit upper-level requirement, and courses from other institutions do not reduce the 30-credit residency requirement.

Students accepted into a degree program at Mason are usually not expected to pursue simultaneous course work elsewhere. For more information, go to the Permission to Study Elsewhere section in the Registration, Attendance, and Grading chapter of this catalog.
Application for a Second Bachelor’s Degree

Those holding one or more bachelor's degrees may earn an additional bachelor's degree at Mason in another discipline. Application for a second bachelor's degree after conferral of a first degree from any regionally accredited institution must be conducted through the Office of Admissions. Second Bachelor's degree applicants should follow the transfer application process outlined on the Admissions Transfer homepage and are subject to the same competitive admissions review as first-degree applicants. After admission, students work with the appropriate academic program to develop an approved contract or course of study of at least 30 credits beyond the first degree, taken after admission to the second degree, to meet university residency requirements. Some units will have more stringent requirements. This contract will detail college-level and major requirements that must be met to satisfy graduation requirements.

Acceptance of Transfer Admission Offer

Admitted transfer students are required to confirm their enrollment by submitting an enrollment deposit by July 1 for fall entrance or December 1 for spring entrance. Enrollment deposits are non-refundable after these deadlines. Admitted students who do not accept the offer of admission by the published deadline may forfeit their space in the transfer class. Students unable to enroll may defer their transfer admission to the next semester after their original admission term upon submission of a Deferral Request Form by the published deadline. Forms are available from the Office of Admissions. Students who wish to decline the offer of admission are expected to inform the Office of Admissions in writing by the deposit deadline and no later than the first day of the semester.

Enrollment after Previous Attendance

Students in good academic standing who have missed two or more consecutive semesters of enrollment (excluding summer term) at Mason and do not meet any of the excluded categories listed below under Readmission after Previous Attendance may re-enter by completing a re-enrollment form available through the Office of the University Registrar at registrar.gmu.edu/forms/index.html. For graduate students and some undergraduate programs, academic department approval is also required.

Readmission after Previous Attendance

Students who have missed two or more consecutive semesters of enrollment (excluding summer term) at Mason must apply for readmission through the Office of Admissions if any of the following conditions are true:

- The student has not been enrolled at Mason for five years or more.
- The student is an undergraduate returning after any absence during which he or she studied at another institution without prior written permission of his or her school or college. Such students must reapply as transfer students.
- The student is in F-1 or J-1 visa status.
- The student was suspended or dismissed from any college or university for nonacademic reasons.
- The student was academically dismissed from Mason.
- The student was ever convicted of a felony.

Right to Withdraw Offer

Mason reserves the right to withdraw offers of admission if applicants fail to satisfy all requirements or it is determined that admission was obtained through the use of incomplete, falsified, altered, or embellished information. In the case of withdrawal of admission from a matriculated student, credit earned at Mason may be withheld. Additionally, the university reserves the right to withdraw the offer of admission to any student based on cancellation of any test score required for admission.
Graduate Admission Policies

Admission to graduate programs is competitive. Selection criteria differ by program and are established by departmental faculty. Applicants are evaluated on the strength of their academic background, results of standardized exams (if required by the program), work experience, and any additional evidence of potential success in the program. Each year, departmental faculty members determine the number of admission offers they may extend by the university resources available for their program.

Admission Standards

To be considered for degree status, the general university graduate admission requirements are as follows:

- An earned baccalaureate degree from a regionally accredited institution of higher education, or international equivalent, verified from official transcripts. (For details, see Admission of International Students section.)
- A 3.00 GPA on a 4.00 scale or better in baccalaureate study. The GPA requirement is higher for many graduate programs. For students with post baccalaureate credits, a separate GPA is calculated for each institution. Note: The difficulty of the baccalaureate degree and work experience may be considered in assessing the requirements for admission.

Provisional Admission

A degree-seeking graduate applicant with a baccalaureate degree who has not met all admission requirements may, at the discretion of the college or department, be offered provisional admission if sufficient evidence is presented to suggest the applicant has the ability to pursue graduate work. As a first priority when starting the graduate program, a provisionally admitted student must satisfy the conditions of admission. Once the student has satisfied the conditions specified in the offer of admission and submitted all admission credentials, the provisional qualifier will be removed from the student’s record. Written confirmation indicating the removal will be sent to the student from the college, school, or institute dean or director.

If the student does not meet the conditions within the first 12 credits (or a more restricted time frame specified by the department in the offer of provisional admission), the student will be terminated from the program. All applicants admitted provisionally are in degree-seeking status, and course work taken appears as part of their graduate-level transcript. Students in provisional status may not take courses in the consortium or elsewhere or transfer graduate course work into their program until the provisions of admission have been met.

Students admitted into a graduate preparation bridge program in provisional status can complete up to 30 credits of coursework in preparation for a graduate degree. While the provision is in effect, graduate students whose registration includes undergraduate courses are considered full time if they meet the undergraduate standard by being registered in at least 12 credit hours per semester.

Graduate Application Requirements

For full consideration for graduate admission, applicants must submit the following:

- Completed online Application for Graduate Study
- Nonrefundable application fee
- Application for Virginia In-State Tuition Rates, if claiming entitlement to these rates
- Two official transcripts from all institutions attended for each program applied to unless the programs are in the same college or school
- Goals statement
- Letters of recommendation as required by the program
- Official exam scores, such as GRE or GMAT, reported directly from the appropriate testing service, as required by the program
• Other materials specified by the program, including departmental forms, portfolio, or interview
International applicants should read the Admission of International Students section for more information on required documentation. Specific departmental admission requirements for degree-seeking students are listed in this catalog under the relevant discipline.

Graduate Applications

Applicants are strongly encouraged to apply online at admissions.gmu.edu. Applications for the School of Law can be found at www.law.gmu.edu. Applying online saves students time and money. In addition, students should collect all supplementary materials and submit them to the appropriate graduate processing center listed below.

Application Processing Centers

The graduate admissions process is decentralized at Mason. Applicants should send their applications and support documents directly to the Graduate Admissions Application Processing Center assigned to their program. Specific mailing instructions are listed at admissions.gmu.edu/grad, as well as below. Once a graduate application is complete and ready to be evaluated for admission, the graduate application file is sent to the academic department for review by the Faculty Admissions Committee. An applicant is notified by mail of the admission decision.

Below is a list of the Graduate Admissions Application Processing Centers with contact information. Graduate admission questions may be directed to the specific center assigned to an applicant’s program by school, college, or institute.

College of Humanities and Social Sciences (CHSS)
Graduate Office
4400 University Drive, MS 2D2
Fairfax, VA 22030
Phone: 703-993-3699
Fax: 703-993-8714
E-mail: chssgrad@gmu.edu

College of Health and Human Services (CHHS)
Graduate Office
4400 University Drive, MS 5A8
Fairfax, VA 22030
Phone: 703-993-1736
Fax: 703-993-3606
E-mail: chhsgrad@gmu.edu

College of Science (COS)
Graduate Office
4400 University Drive, MS 6A3
Fairfax, VA 22030
Phone: 703-993-9532
Fax: 703-993-9034
E-mail: cosgrad@gmu.edu

College of Education and Human Development (CEHD)
Graduate Office
4400 University Drive, MS 4D1
Fairfax, VA 22030
Phone: 703-993-2010
Fax: 703-993-2020
E-mail: cehdgrad@gmu.edu
The Volgenau School of Engineering (VSE)
4400 University Drive, MS 3D5 (use MS 5C8 for PhD programs)
Fairfax, VA 22030
Phone: 703-993-1512
Fax: 703-993-1242
E-mail: vsegadm@gmu.edu

School of Law (SOL)
3301 Fairfax Drive, MS 1G3
Arlington, VA 22201
Phone: 703-993-8010
Fax: 703-993-8088
E-mail: lawadmit@gmu.edu

School of Management (SOM)
Graduate Office
4400 University Drive, MS 1C9
Fairfax, VA 22030
Phone: 703-993-1158
Fax: 703-993-2392
E-mail: somgrad@gmu.edu

School of Public Policy (SPP)
Graduate Office
3351 Fairfax Drive, MS 3B1
Arlington, VA 22201
Phone: 703-993-8099
Fax: 703-993-4876
E-mail: spp@gmu.edu

College of Visual and Performing Arts (CVPA)
Graduate Office
4400 University Drive, MS 1C9
Fairfax, VA 22030
Phone: 703-993-1158
Fax: 703-993-2392
E-mail: cvpagrad@gmu.edu

School for Conflict Analysis and Resolution (SCAR)
Graduate Office
3351 Fairfax Drive, MS 4D3
Arlington, VA 22201
Phone: 703-993-3655
Fax: 703-993-1302
E-mail: icarinfo@gmu.edu

Krasnow Institute for Advanced Study (KR)
(Computational Social Science Admissions only)
Graduate Office
4400 University Drive, MS 6B2
Fairfax, VA 22030
Phone: 703-993-9298
Fax: 703-993-9290
E-mail: cssgrad@gmu.edu
Graduate Admission Exams

Most graduate programs use test scores as an additional measurement of an applicant’s qualifications. For departmental admissions test requirements, consult the table at admissions.gmu.edu/grad.

Information and registration bulletins for all national graduate admissions exams are available at the University Admissions Office.

The GRE may be taken in two forms: the general exam and subject exam. Some departments require official scores for both types of exams. Students may schedule the computer-based GRE general exam by calling 800-473-2255. Students may register for the GRE subject exam online at www.gre.org. **To have GRE scores sent to Mason, please use school code 5827.**

The GMAT is accepted by many graduate programs at Mason. The School of Management accepts the GMAT or GRE. Students may schedule the computer-based GMAT online at www.mba.com.

The Miller Analogies Test (MAT) is a test of 100 analogies and may substitute for the GRE in some graduate programs. **To have official MAT scores sent to Mason, use Mason’s MAT code 1768.** For information about scheduling the MAT, call 800-622-3231 or go to www.tpcweb.com - Miller Analogies Test.

The Praxis I is required by the College of Education and Human Development for graduate applicants to initial teacher licensure programs. Students may schedule the Praxis I by calling 800-853-6773. Passing scores on both Praxis I and Praxis II exams are required for program completion.

All Mason graduate programs strictly require applicants to meet the English proficiency standard. Applicants who have earned a bachelors, masters, or doctoral degree from a regionally accredited university in the United States, Canada (excluding province of Quebec), United Kingdom, Ireland, Australia, and New Zealand are considered to have met that standard. All other applicants are required to take an English proficiency examination and meet minimum scores set by Mason in order to be considered for admission. The TOEFL IELTS – Academic exam, or Pearson Test of English can be used to meet this requirement. Additional information on English language proficiency requirements can be found in the Graduate Policies section of this catalog.


Foreign Language Requirements

Certain graduate programs require students to demonstrate foreign language proficiency at a specified level. Students entering programs that require intermediate-level proficiency can demonstrate that proficiency via previous course work that is equivalent to Mason's foreign language course numbered 210 or, in some programs, by passing an exam. Contact the academic program for information on how to demonstrate language proficiency.

Admission of Graduate Degree Holders

Those holding one or more graduate degrees may earn an additional graduate degree in another discipline. For admission to a second graduate degree program, students should submit an application, transcripts, and other documents as required by the second degree program. Course credits used to satisfy the degree requirements for the first graduate degree may not be used to satisfy the degree requirements for the second graduate degree. In programs with overlapping or similar requirements, students will be advised in the subsequent degree program regarding appropriate course substitutions for subjects already covered.

Offer of Admission

The written offer of admission specifies the effective date of admission, category of admission offered, and name of the faculty advisor assigned to the applicant. This offer is good only for the semester for which the applicant applies. The offer must be
accepted by returning an Intent to Enroll form and a deposit, if required by the school or college. Those whose offer of admission has lapsed must submit a new application and fee to be reconsidered for admission at a later date. Students may simultaneously apply to more than one graduate program, but if they are admitted to more than one program, they may accept only one offer and pursue only one degree program at a time.

Right to Withdraw Offer

Mason reserves the right to withdraw offers of admission if applicants fail to satisfy all requirements or it is determined that admission was obtained through the use of incomplete, falsified, altered, or embellished information. In the case of withdrawal of admission from a matriculated student, credit earned at Mason may be withheld. Additionally, the university reserves the right to withdraw the offer of admission to any student based on cancellation of any test score required for admission.

Reactivation of Deferred Applications

Applicants are notified when action on an application has been deferred pending completion of courses that are prerequisite to graduate study in a chosen field. Applicants are encouraged to notify their program’s Graduate Admissions Processing Center in writing as soon as prerequisites have been met. Applicants are responsible for furnishing official transcripts confirming that prerequisite courses have been satisfactorily completed. An admission decision cannot be made until these grades are received.

Change in Field of Graduate Study

Admission for graduate study is admission to a specific program. Therefore, a student is not free to change graduate programs at will. Students seeking to change from one graduate program to another (at the same level and within the same college) need the approval of their dean and should contact their dean's office for the appropriate form and instructions. Note that residency requirements must be met after the change to the new program, no new time limit is given, and the student must resign from the previous program. For students seeking a change between two colleges, resignation from the previous program, a new application, application fee, official transcripts, and proof of degree from prior institutions are required. Previous acceptance into one graduate program does not guarantee acceptance into another.

Graduate Study during Summer Term

Graduate programs do not admit for summer term, however, students accepted for the fall semester are considered admitted students and some graduate programs may allow students to take courses during the preceding summer.

Records Maintenance and Disposal

All admissions documents, including academic records sent from other institutions, become part of the official university file. Admission credentials are retained for only 12 months. They are subsequently destroyed if applicants do not register for courses within the period for which the offer of admission is valid; have been denied admission; do not respond to requests for additional information; or fail to submit complete applications, including all official transcripts and test results.

Admission of International Students

General Requirements

Application for admission by international students should be made directly to the Office of Admissions via the online application.
Application deadlines are as follows:

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<th>Fresman Fall:</th>
<th>Transfer Fall:</th>
<th>Freshmen Spring:</th>
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<td></td>
<td>January 15</td>
<td>March 1</td>
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Graduate: Varies by academic program. Please check admissions.gmu.edu/grad for specific program details.

These deadlines ensure adequate time to process applications and prepare immigration documents. All international applications must be accompanied by the nonrefundable application fee. Items that must be submitted with the application form and fee are official transcripts and degree certificates (in original language and, if applicable, certified English translation); evidence of English proficiency (via official score reports from the TOEFL IELTS or Pearson exam); the Certificate of Financial Responsibility (CFR); financial support documents; copy of passport identification page; and for those present in the United States, copies of immigration documents verifying current nonimmigrant status. Other documentation such as recommendation letters, essays, portfolios, etc., may be required by the academic program. Please visit admissions.gmu.edu for full details on items required and deadlines.

Applications from international students are reviewed with all other applications. Admission to the university is competitive; therefore, while minimum standards ensure that an application will be considered, they do not guarantee admission. The number of applicants, qualifications of the applicant pool, and the amount of available space determine the number of admission offers that Mason can make. In addition to overall admission requirements, some schools and colleges have individual requirements for acceptance into the major. For more information, see school or college admission requirements.

Applicants who are accepted to a program will receive a written offer of admission. Most students come to the United States on an F-1 visa, but students who are sponsored by the U.S. government, their home government, or another organization may be required to enter the United States on a J-1 Exchange Visitor’s Visa. To be issued an immigration document (Form I-20 for F-1 status or Form DS2019 for J-1 status), students must prove they have sufficient financial support to cover their expenses while at Mason. If the documentation submitted is satisfactory, the university will issue Form I-20 for F-1 status or Form DS2019 for J-1 status and mail it to the address indicated on the Certificate of Financial Responsibility.

International students outside the United States may use their immigration documentation to schedule a visa interview with the U.S. embassy or consulate nearest their place of residence and apply for an F-1 or J-1 student visa. For more information about the visa application process, check with the nearest U.S. embassy or consulate, or go to the Department of State’s web site: www.state.gov.

Students in a nonimmigrant visa category other than F-1 or J-1 may submit the CFR and copies of immigration documents indicating their immigration status. They do not need to submit financial support documents unless they plan to change to a student visa. For more information pertaining to immigration status, contact the Office of International Programs and Services (OIPS) at 703-993-2970. Additional information is available on the OIPS web site: oips.gmu.edu.

**Freshman and Transfer Requirements**

A freshman student is a first time university student who has never enrolled in a college or university before while a transfer student is one who has completed course work at another college or university after graduating from high school. In addition to the requirements defined for all applicants, international students must meet the following standards:

- Freshman applicants must submit certified official copies of all secondary or high school transcripts in the original language along with an English translation, if applicable. Results of any exit certificates or university entrance exams also must be submitted.
- All freshman applicants are required to submit satisfactory scores on the SAT I or ACT exam score if required by their academic program or the Office of Admissions.
- Applicants must demonstrate English proficiency. Applicants whose native language is not English are required to submit TOEFL, Pearson Test of English, or IELTS exam results. To be considered for admission, applicants must have scored at least 230 on the computer-based TOEFL, 88 on the Internet-based TOEFL, 570 on the paper-based TOEFL...
and 4.5 on the TOEFL essay, or must have received a score of 6.5 or higher on the IELTS exam, or a 59 overall band score on the Pearson Test of English. Official test scores must be sent directly from the Educational Testing Service or IELTS. For more information, visit Test of English as a Foreign Language web site at www.toefl.org, the IELTS web site at www.ielts.org, or the Pearson Test of English web site at www.pearsonpte.com.

- All transcripts from colleges or universities outside the United States must be translated into English and evaluated by a recognized U.S. evaluation service before an admission decision can be made. Applicants are responsible for the timely translation and evaluation of documents and all costs and fees associated with these services. A list of accepted evaluation agencies is available at www.naces.org/members.htm.
- International students already in the United States with F-1 status must complete immigration transfer procedures within 15 days of the program start date. For processing of immigration transfers, contact OIPS at 703-993-2970 or oips.gmu.edu.

Graduate Requirements

International students interested in pursuing graduate study must meet the following requirements:

- In order to be considered for admission, applicants must complete the online Application for U.S. Graduate Study and submit all required materials, including any supplemental documentation required by their academic program.

English Proficiency Standards

Mason students participate in rigorous graduate coursework as part of their university educational experience. Therefore, students at Mason must have a full command of academic English at the graduate level in order to be successful throughout their studies. All new graduate students are expected to accurately comprehend written graduate-level English, clearly understand rapidly spoken English in classroom lectures and in professional settings, write with proper grammar and syntax, and be able to respond quickly in English using a vocabulary appropriate for collegiate settings.

For this reason, Mason has a high standard of English proficiency for graduate admission. All Mason graduate programs strictly require applicants to meet that English proficiency standard. Applicants who have earned a bachelors, masters, or doctoral degree from a regionally accredited university in the United States, Canada (excluding province of Quebec), United Kingdom, Ireland, Australia, and New Zealand are considered to have met that standard. All other applicants are required to take an English proficiency examination and meet minimum scores set by Mason in order to be considered for admission. The TOEFL, Pearson Test of English, or IELTS exams can be used to meet this requirement.

Decisions regarding English proficiency are the sole discretion of Mason Admissions offices.

Listed below are the English proficiency examinations that Mason accepts and the corresponding minimum score requirements and submission procedures. Individual programs reserve the right to set higher minimum scores:

TOEFL

IBT  88 points total AND a minimum of 20 points in each section
CBT  230 points
PBT  570 points

IELTS - Academic
6.5 total band score

Pearson Test of English
59 overall score
All English proficiency scores are valid for two years from the test date. Official test scores must be provided directly from the testing agency. For TOEFL, IELTS, and the Pearson Test of English, please make sure you have scores sent to the Mason Office of Graduate Admissions. It is not necessary to use the exact department code as test scores arrive to our institution electronically.

- All transcripts from colleges or universities outside the United States must be translated into English, if applicable, and submitted for evaluation to the graduate school to which the applicant is applying. Mason will provide evaluation service free of charge for all international transcripts. Because of volume, more time may be needed to process applications requiring a Mason evaluation. For expedited service, students can submit their documents to a recognized U.S. evaluation service at their own expense. A list of recognized evaluation services is available in Mason’s Admissions Office or at www.naces.org.
- Graduate students’ documents should show the award of either a bachelor’s degree or equivalent, or a graduate degree.

For Students with International Degrees

Mason requires the equivalent of a four-year U.S. bachelor's degree from an appropriately accredited international institution of higher education for admission to a graduate degree program. All applicants who were educated outside the United States are required to submit an official credential evaluation, written either by an approved evaluation company or by Mason evaluators. Complete information on this and all international admissions requirements can be found at admissions.gmu.edu/global/intlAdmissionRequirements.asp. Mason Admissions has final authority on equivalency of degrees.

Special Conditions for International Applicants

A complete list of application requirements at all levels can be found online at admissions.gmu.edu/global/intlAdmissionRequirements.asp. It is also important to note the following:

- Federal regulations prohibit students on visitor visas (B-1 and B-2) from enrolling in school. Students who entered the United States on a visitor visa should not plan to study. For more information, contact OIPS.
- Federal regulations prohibit F-2 spouses of F-1 students from engaging in full-time study, and F-2 children may engage in full-time study only from kindergarten through 12th grade. F-2 dependents may engage in study that is avocational or recreational in nature. F-2 dependents seeking to pursue full-time or degree study in the United States must change their status to F-1. For more information, contact OIPS.
- Students enrolled at the university in F-1 or J-1 nonimmigrant status must maintain full-time enrollment each fall and spring semester. For undergraduate students, this means 12 credit hours each semester. Full-time status for graduate students is defined by the Office of the University Registrar, and information can be found in the Graduate Policies section of this catalog. Because of this requirement, F-1 or J-1 international students do not qualify for part-time programs.
- Admission for international students is offered for fall (August) and spring (January).
- Prospective students who seek to enter the United States in F-1 or J-1 immigration status, or who seek to attend Mason following attendance at another US school, must complete the Certificate of Financial Responsibility (CFR), which can be downloaded from admissions.gmu.edu. The form and financial support documents must be submitted to the Admissions Office with the application.
- Students already in the United States should submit copies of immigration documents verifying current nonimmigrant status. This documentation should be submitted with the application for admission.
- Prior to issuing an I-20 or DS-2019 form, the University is required to verify that a student has sufficient financial support to pay for both educational and living expenses. If source is a sponsor, confirmed funding must be documented for the first year of study, typically with a sponsor letter and current bank statement or a scholarship award letter or an assistantship offer. The source of funds for subsequent years must be shown, although for sponsored students a bank statement is required only for the first year. Students who are self-funded must show funds on deposit for the full term of their program. The CFR gives an estimate of annual expenses, including tuition, living expenses, and health insurance; and it also explains what type of documentation is accepted.
All new students admitted to the university must submit an Immunization Record Form signed by a health care provider. Requirements, information and forms are available at shs.gmu.edu/immunizations.

Financial sponsors who wish to be billed directly must provide a U.S. billing address. Mason does not bill third parties overseas. It is the student’s responsibility to make sure tuition and fees are paid on time.

International Student Health Insurance

University policy requires all F-1 and J-1 visa students to have health insurance. Federal law requires all students on a J-1 visa to have health insurance that includes coverage for medical evacuation and repatriation. Medical evacuation coverage pays for returning a seriously ill student to his or her home country. Repatriation coverage pays for returning a student’s remains to his or her home country.

Mason offers health insurance for students on J-1 and F-1 visas. When international students register for classes, the cost of this coverage is automatically billed to their account by the Office of Student Accounts. This fee is due by the tuition payment due date. Failure to pay this insurance fee or successfully obtain an exemption may result in the cancellation of class registration. Late fees may be assessed if charges are not paid by the deadline established by the Student Accounts Office.

International students are required to purchase insurance for fall and spring/summer semesters.

Exemption from the International Student Health Insurance

International students are automatically enrolled in the Mason Student Health Insurance Plan. International students with health insurance coverage from the following list may request an exemption from the Mason Student Health Insurance Plan. Submission of a request does not guarantee that a waiver will be granted. The Student Health Insurance Office reserves the right to audit all waivers in order to ensure compliance with University Policy 6002.

Students may apply for an exemption:

1. If they have a scholarship or government-sponsored program that provides insurance for them that meets or exceeds the Mason Student Health Insurance Plan.

2. If they or their spouse or parent have a United States employer who provides health insurance for them that meets or exceeds the Mason Student Health Insurance Plan.

Each fall, continuing F-1 and J-1 visa students are required to either pay for the Mason Student Health Insurance or successfully obtain an exemption. Exemptions must be obtained no later than one week after the last day to add/drop classes.

For more information and exemption form, please visit shs.gmu.edu/insurance.

Non-degree Enrollment

Non-degree Status

Non-degree status enables students who have no immediate degree objective or may need to satisfy prerequisites for admission to a degree program to enroll in courses for which they are qualified without seeking formal admission to a degree program. Enrollment in specific courses is based on eligibility criteria and availability of space in courses; in high-demand fields, enrollment may be restricted or prohibited.

All non-degree applicants must complete a non-degree online application for admission and supply official transcripts from all postsecondary institutions they have attended. High school guest applicants must submit an official high school transcript.
International students are typically not admitted in non-degree status. The only exception is for those students who attend George Mason University pursuant to the terms of an exchange agreement or memorandum of understanding between Mason and their home university. Those students are required to process their applications and all documentation through the Center for Global Education, and to pay the associated fee.

Non-degree application information and deadlines are available online at admissions.gmu.edu.

Standards for Admission

Admission to Mason as a non-degree student is competitive and based on space availability. Non-degree admission is not automatically granted, and non-degree admission does not guarantee enrollment in any specific course or any future degree programs. Non-degree applicants must meet the standards for admission that would apply to the equivalent degree-seeking status.

Graduate Non-degree

Admission to non-degree graduate study at Mason is highly competitive. Among the factors which may be considered in the admissions process are previous academic performance, professional experience, academic fit, and other standards, at the discretion of each graduate unit. Some graduate units do not accept non-degree applications.

Individual units and majors may have additional requirements for non-degree graduate status (see below and also admissions.gmu.edu/nondegree). Once admitted to graduate non-degree status, students are considered graduate students and tuition charges are calculated as such, regardless of the level of course(s) in which they are enrolled. A student cannot graduate or receive a degree while in non-degree status. Non-degree graduate students may not register for classes numbered 700 or higher. All master’s programs require at least 18 credits to be completed in degree status at Mason to be considered for graduation, and some graduate programs allow a maximum of 6 credits to be transferred from non-degree status. Students who plan to seek a degree from Mason are strongly encouraged to apply for degree status admission and seek departmental advising as soon as possible.

Non-degree students are expected to maintain the same academic standards as degree-seeking students. See Academic Termination in the Graduate Policies section of this catalog.

Undergraduate Non-degree

Qualified high school students, current college students, and college degree holders may apply to enroll in non-degree undergraduate classes via the online undergraduate application. Transcripts from all colleges attended are required. High school transcripts may be required.

Applicants with a bachelor’s degree seeking to take undergraduate courses must meet the standards for admission for a bachelor’s degree. These students will be considered undergraduate students and are not eligible to take graduate courses or receive graduate academic advising. Students who later seek to enroll in graduate courses or wish to receive graduate academic advising must submit a new non-degree graduate application and be reconsidered for admission.

Non-degree studies students are allowed to register for a maximum of 10 credits per semester. A maximum of 18 undergraduate credits may be applied to an undergraduate degree program on approval of the undergraduate program’s dean.

All undergraduate non-degree students are subject to the academic standing regulations and sanctions described in the Requirements for Retention section in the Academic Policies chapter of this catalog.

High School Guests

Students who are currently enrolled in good standing in high school but have not yet graduated from high school and do not have a GED may be considered for admission as high school guests. These applicants will be evaluated based on their academic
performance in high school. Only students who have excelled in high school and demonstrate the preparation and maturity indicative of the potential to succeed in Mason’s competitive course work will be admitted. Mason cannot guarantee that courses will fulfill high school graduation requirements or that courses taken while a high school guest will transfer to other institutions.

**Academic Advising**

On initial enrollment, non-degree students are assigned to one of the colleges, schools, or institutes at Mason according to their original course selection and level (graduate or undergraduate). Once assigned, the academic unit is responsible for advising and handling requests that require a dean’s permission.

Grades earned through non-degree studies remain a part of the student’s permanent non-degree record and are recorded on the standard university non-degree transcript. They will not appear on the degree transcript unless the student is accepted to a degree program and permission is given by the dean to apply the non-degree credit to the degree program.

**Senior Citizen Waiver Program**

Under terms of the Senior Citizen Higher Education Act of 1974, eligible Virginia residents 60 years of age or older, with a taxable income not exceeding $15,000, are entitled to enroll in courses offered for academic credit on a space available basis without paying tuition and enrollment fees via the Senior Citizen Waiver Program. In order for this to occur, the applicant must meet all admission requirements. Senior citizens who meet all admission requirements, the income eligibility requirement, and have completed a minimum of 75 percent of degree requirements may enroll in a degree program during normal registration periods without paying tuition and enrollment fees. The admissions application fee cannot be waived, but students who qualify to have all tuition and fees waived will have the application fee reimbursed. For specific information about the program, please visit admissions.gmu.edu and submit all required transcripts and documents. If the application for admission is approved, qualified senior citizens can request a waiver of tuition and enrollment fees by completing the Senior Citizen Tuition Waiver Form, available from the Office of the University Registrar or online at registrar.gmu.edu/forms/index.html. To facilitate processing, senior citizens should provide their Mason student identification number on the waiver form.

In addition, the act allows admissible senior citizens to audit courses (no academic credit is received) and enroll in up to three noncredit courses per semester without paying tuition and enrollment fees, regardless of the taxable income level. Students seeking to audit a class must notify the Office of the University Registrar when registering for classes. Fees for course materials may apply to senior citizen enrollees, and tuition may be charged for courses designed exclusively for senior citizen groups. Senior citizens must adhere to all admissions and registration policies and processes and follow normal procedures to add and drop courses within the deadline dates outlined in each semester’s academic calendar.

**Summer Term**

Phone: 703-993-2300  
Fax: 703-993-8871  
Web: summer.gmu.edu

Summer enrollment provides an opportunity for eligible undergraduate, graduate, and non-degree students to begin or continue the pursuit of their academic goals. Courses are offered in intensive five- to eight-week sessions, as daytime and evening classes and as distance education courses. Many academic departments take advantage of the unique summer term opportunities to schedule innovative programming focusing on raising community awareness and involvement.

Summer registration for current Mason students begins in mid-March while registration for non-degree students begins in late March to early April. Students who are new to Mason are required to apply and be evaluated for admission. Prospective students should apply online at admissions.gmu.edu/applynow.
Academic Testing

Advanced Placement and Credit by Exam

The Office of Admissions awards transfer credit for several advanced standing examinations based upon minimum score requirements established by Mason academic departments. A complete list can be found at admissions.gmu.edu/exams. Students are responsible for providing official test score transcripts at time of application. Transfer credit evaluations are considered final after the first academic year of enrollment.

Mason Departmental Exams

Proficiency exams are offered in a number of courses usually taken during the first two years. Students may not earn credit by exam for courses in which they are currently enrolled beyond the time allotted to add courses in that semester, or for courses already audited or failed at the university. Transfer students may not earn by exam any part of the 30 credits that must be completed at Mason to earn a degree.

English 101 and English 302 Proficiency Testing

The English Department offers proficiency testing for the required composition courses English 101 and English 302. Students seeking a waiver for English 101 may take the English 101 Proficiency Exam. Students seeking a waiver for English 302 may submit a writing portfolio to the English Department and complete a timed exam. Students who receive a waiver through these processes do not also receive course credit. Additional information can be found on the exemptions page of the Composition website composition.gmu.edu/waivers.

Foreign Language Placement

SAT Subject Tests in foreign languages are used for placement in many of the languages offered at Mason. Freshman applicants who wish to receive the appropriate foreign language placement should take this exam during their senior year in high school. The SAT Subject Test in foreign language is mandatory for anyone who has studied one of these languages for at least two years, has no previous college credit in the language, and seeks to continue study of the same language at Mason. Transfer students receiving credit for college-level foreign language study completed at other colleges usually do not need a placement test, but should consult the Department of Modern and Classical Languages to determine correct placement.

For students who wish to continue the study of a language at Mason, it is the student’s responsibility to take a placement exam and obtain results before enrolling in a foreign language course. The placement exam is given in conjunction with orientation. The schedule can be found on the website of the Department of Modern and Classical Languages. Specific information on interpreting test scores can be obtained from the department.

Some students whose degree programs require intermediate proficiency in a foreign language may be eligible for a waiver of the requirement based on prior knowledge of foreign language. For information on waiver of the foreign language requirement see the website of the Undergraduate Academic Affairs Office of the College of Humanities and Social Sciences.

Math Placement Exam

The Math Placement Exam is a computer-based test to help assess a student’s proficiency. Entering students are required to complete the exam successfully during orientation unless they have received transfer credit for a mathematics course used to satisfy the University's quantitative reasoning general education requirement. The web address for the math placement test schedule is located at math.gmu.edu.
Academic Policies

Click on a link below to be taken to the policy.

- Registration, Attendance, and Grading
  - Academic Calendar
  - Academic Load
  - Registration Procedure
    (Prerequisites and corequisites, changing registration, canceling registration, repeating a course, auditing a course)
  - Special Registration Procedure
    (Advisor's permission to register, permission to study elsewhere, permission to register as a graduate student, graduate course enrollment by undergraduates, special registration for nonenrolled students, enrolling for credit without grade points, Academic Common Market, University Consortium)
  - Withdrawal
  - Attendance Policies
  - Final Exams
  - Grading System
    (Additional grade notations, midterm reports, final grades, transcripts, GPA, change of grade, grade appeals)
- Course Information
  (General information, contact hours, undergraduate numbering, graduate numbering)

- Undergraduate Policies
  - Student Classification
  - Academic Advising
  - Academic Standing
    (Academic period, good academic standing, student retention categories, termination from the major, academic suspension, academic dismissal, academic performance and credit limit, academic standing and student activities, academic clemency)
  - Requirements for Undergraduate Programs
    (Declaration of major, requirements for bachelor's degrees, second bachelor's degree, minors, undergraduate certificates, change of academic program, credit for more than one undergraduate major)
  - University Honors
  - Dean’s List

- Graduate Policies
  - Student Classification
  - Full-time Classification
  - Academic Advising
  - Student Status
    (Change from nondegree status, removing provisional qualifier, permission to re-enroll, voluntary resignation from graduate academic program)
  - Credit by Exam, Reduction or Transfer
    (Credit by external exam, reduction of credit, transfer of credit, permission to study elsewhere)
  - Graduate Grading
  - Graduate Academic Standing
    (Academic warning, academic termination, academic dismissal)
  - Combined Bachelor’s and Accelerated Master’s Degrees
  - Requirements for Graduate Certificates
  - Requirements for Master’s Degrees
  - Requirements for Doctoral Degrees
- Degree Application, Conferral and Commencement
  - Application for Degree
  - Degree Conferral
  - Commencement
- Research
  - Human Subjects Research
  - Animal Use in Research
Registration, Attendance, and Grading

Return to: Academic Policies

- Academic Calendar
- Academic Load
- Registration Procedure
  (Prerequisites and corequisites, changing registration, canceling registration, repeating a course, auditing a course)
- Special Registration Procedure
  (Advisor’s permission to register, credit to be earned at other institutions, permission to register as a graduate student,
  graduate course enrollment by undergraduates, special registration for nonenrolled students, enrolling for credit without
  grade points, Academic Common Market, University Consortium)
- Withdrawal
- Attendance Policies
- Final Exams
- Grading System
  (Additional grade notations, midterm reports, final grades, transcripts, GPA, change of grade, grade appeals)

Registration for the next semester or summer term begins after mid-semester of fall or spring semesters and is opened to various
groups according to priority (graduate students, seniors, juniors, and so on). The Office of the University Registrar assigns each
student a time ticket, which is a specific date and time after which a student may register. The time ticket is based on the number
of credits earned. Thus, the time ticket will not be the same for all students within a particular priority group. Students should
consult registrar.gmu.edu and Patriot Web for information about their registration date and time.

Academic Calendar

The academic calendar may be accessed at registrar.gmu.edu. Mason runs on a semester schedule, including an active summer
term.

Academic Load

The minimum full-time load for undergraduate students is 12 credits per semester. For graduate full-time classification, see the
Graduate Policies section. For planning purposes, applicants for admission are asked to indicate their preference for full- or part-
time status, and day or evening classes; however, they may freely choose between evening and day sections of courses and may
change their full- or part-time status.

Although many students must work to meet living expenses, employment must not take priority over academic
responsibilities. Students employed more than 20 hours a week are strongly urged not to attempt a full-time academic load.
Students employed more than 40 hours a week should attempt no more than 6 credits per semester. Students who fail to observe
these guidelines may expect no special consideration for academic problems arising from the pressures of employment.

Although 12 credits per semester represent a minimum full-time undergraduate load, students planning to graduate in four years
need to carry an average of at least 15 credits per semester. Written approval must be submitted to the Office of the University
Registrar before students can register for more than the maximum allowable credits. Undergraduate and Nondegree
Undergraduate students should contact their Dean for permission. Graduate and Nondegree Graduate students should contact
their department for permission.

<table>
<thead>
<tr>
<th>STUDENT STATUS</th>
<th>MAXIMUM CREDIT LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>18</td>
</tr>
</tbody>
</table>
Financial Good Standing; No Holds on Record

Financial good standing and a university record clear of holds are required for students to receive academic services. Services, including, but not limited to, transcript issuance, diploma release, and class registration (add, drop, withdrawal, and such) will not be provided to students with a financial balance due or a hold of any kind on their record. Holds are based on outstanding obligations and may be financial. Examples include fines owed for traffic or parking violations, incomplete immunization records, fines owed to the Mason or consortium libraries, and other administrative holds.

Registration Procedures

Patriot Web will list specific course information before priority registration each semester. Courses listed may be canceled for insufficient enrollment. Mason reserves the right to change the class schedule and adjust the individual section enrollment as necessary.

Registration is usually accomplished using Patriot Web; however, if a section is closed or registration into a selected section is controlled, permission to enroll must be obtained from the academic program offering the course. Various schools and departments have their own processes for granting this permission. For some courses, the student must submit a completed and signed course permit form in person to the Office of the University Registrar.

Students must be present at the first meeting of every laboratory course (lecture and laboratory) to validate their registration. If students cannot attend the first meeting, they must notify the instructor beforehand if they intend to continue in that section. Otherwise, their name may be removed from the class roll in both lecture and lab.

Students are responsible for registering properly and paying by the deadline. Students should confirm the correctness of their enrollments (including drop and add) via Patriot Web. Incorrect enrollments may result in academic and financial penalties.

Students are responsible for tuition payments and grades received for all courses in which they are registered unless registration is canceled administratively because of suspension, dismissal, or termination; the section is canceled; or the student drops the course before the tuition liability begins. See registrar.gmu.edu for deadlines.

Course Prerequisites, Corequisites

Course prerequisites or corequisites state requirements for student entry into courses and reflect necessary preparation for attempting the course. It is the student’s responsibility to be aware of these as stated in the catalog and to have taken prerequisites recently enough to be of value. The administrator of the academic unit in which the course is taught or the instructor of the course may summarily drop students who have enrolled in a course for which they have not met the prerequisites. Graduate course prerequisites are normally met with a grade of B- or better; undergraduate course prerequisites are normally met with a grade of C or better. Individual programs may have higher standards. Questions should be addressed to the academic department or course instructor.

Changing Registration

Registration changes must be completed within the schedule adjustment period defined below. Changes to registration are usually made via Patriot Web.
The last day for adding a 14-week course is eight calendar days after and including the first day of classes. The last day for dropping a 14-week course is five calendar weeks after the first day of classes (including the first day). Courses meeting for fewer than 14 weeks have add, drop, and tuition-liability dates proportional to their length. These dates are published on the Office of the University Registrar’s web site each semester. Students who drop all courses during the drop period will have no entry on their transcript for that semester and will not be considered an enrolled student for that semester. If it is the student’s first semester, the student will not have a Mason transcript and must contact Admissions regarding enrollment in a future semester.

All students are expected to complete their initial enrollment before the first day of classes for the semester. Any additions to that enrollment must be processed by the end of the add period through official registration procedures. Students will not receive credit for courses unless their names are on the official class rosters and final grade sheets. **Retroactive credits will not be awarded to students who report that they attended classes but were not on the official rosters.** After the last day to add, students will not be added to courses except in unusual circumstances beyond the student’s control; such actions require approval by the chair of the academic department offering the course.

All students are expected to drop (by the end of the drop period) those courses they do not intend to continue. Registration is not canceled for failure to drop courses properly. Furthermore, registration is not canceled for failure to attend classes unless stated otherwise on Patriot Web. **All classes in which a student is enrolled past the drop deadline will remain part of the official academic record.** For more information, see Additional Grade Notations in the Grading System section of this chapter. After the drop deadline, withdrawal approval is granted only for nonacademic reasons by the student’s academic dean. This approval is typically given for all courses at once, constituting withdrawal from a semester. For more information, see the Withdrawal section of this chapter.

No change of registration transaction is complete until it is submitted through Patriot Web or processed by the Office of Student Accounts and the Office of the University Registrar through in-person procedures.

**Students will not receive written confirmation of schedule changes and are responsible for checking their schedules via Patriot Web before the end of the add or drop period to verify that their schedules are correct and they are properly enrolled. Students will not be allowed to remain in classes unless they are properly enrolled. Students are responsible, both financially and academically, for all courses in which they remain officially enrolled.**

**Canceling Registration**

Students who cannot attend classes during the semester for which they have registered should cancel registration using Patriot Web prior to the first day of classes for the semester.

Refunds of tuition on and after the first day of classes are made according to the tuition-liability dates published in this catalog and registrar.gmu.edu.

**Repeating a Course**

Effective July 1, 2011 Federal Regulations no longer allow federal student aid funds to apply to courses that a student has already taken twice with a passing grade. This limitation does not include courses that are "repeatable for credit," as described below. Students should contact the Office of Student Financial Aid to determine how repeated course work would affect their financial aid eligibility.

Some courses are annotated in the catalog as “repeatable for credit.” These are courses which students may repeat and receive additional credit for each time the course is taken. The maximum number of credits is specified in the Course Description section of the catalog. Special topics and independent study courses are examples. For all other courses, the following conditions apply:

- Graduate students who have passed a course with a satisfactory grade are not permitted to repeat the course for replacement credit. Grades of B- are considered satisfactory, unless the academic program specifies a higher minimum satisfactory grade. Students must obtain permission from their academic program to repeat a course in which they have earned an unsatisfactory grade. Each department establishes procedures for granting such permission. Duplicate credit is not earned. When a course is repeated, all credits attempted are used to determine warning, termination, or
dismissal; the transcript shows grades for all courses attempted; and only one grade per course may be presented on the degree application.

- Some courses, such as special topics courses, are repeatable for a limited number of additional credits. As long as students do not exceed the maximum allowable credits for repeatable courses, all takings of the course count for credit and in the student’s GPA. In cases where the student has exceeded allowable credits in a repeatable class, the transcript will exclude the grade and credits of the earliest taking of the class.

- For undergraduate classes not repeatable for credit, undergraduate degree students may repeat courses for which they seek a higher grade. Academic programs may restrict repeats of certain departmental or college courses in the major. Excessive repeats may result in termination from the major by a student’s dean. A grade received in a repeated course will replace a grade in prior takings of the same course in the calculation of the cumulative GPA, even if the more recent grade is lower. Duplicate credit is not given. Repeat rules apply to taking the same course and courses designated in the catalog as equivalent. Repeat rules apply throughout a student’s academic history. All instances of courses and their grades remain part of the student’s transcript. No adjustment to the cumulative GPA will be made when the grade in the repeated course is W. A grade in a Mason course will not be excluded from the cumulative GPA based on a subsequent taking of an equivalent course at a transfer institution. The exclusion of earlier grades of repeated courses will not change the academic standing or dean’s list notations for the earlier semester. Note that individual programs may disallow students from retaking certain high-demand courses simply for the purpose of improving their grade. Programs may also require departmental permission for students to repeat certain department, school, or college courses.

Auditing a Course

Auditing a course requires the instructor’s permission. Audit forms are available at registrar.gmu.edu. A previously audited course may be taken again for credit in a later term. Students may also audit a course previously taken and passed; however, students may not change from credit to audit status nor from audit to credit status after the end of the drop period, as defined above. The usual tuition and fees apply to audit status.

Special Registration Procedures

Advisor’s Permission to Register

All newly admitted students, undeclared undergraduates on academic warning or academic probation, and undergraduates returning from suspension, are required to obtain an advisor’s approval for registration. All students are strongly encouraged to consult with their advisors concerning course registration each semester.

Permission to Study Elsewhere

Students who apply for admission to Mason usually do not seek simultaneous enrollment at another collegiate institution. In those unique situations when a student does seek concurrent enrollment, the student must obtain advance written approval from their academic dean. This process permits a student to enroll elsewhere in a suitable course unavailable at Mason. Catalog numbers and descriptions of courses to be taken elsewhere must be submitted with the request for approval. Students must submit an official transcript for all such course work to the Office of the University Registrar. Note that while credit may be approved for transfer and a minimum grade must be achieved, grades themselves do not compute into any Mason GPA. Students who enroll elsewhere without advance written permission while enrolled at Mason may not receive transfer credit for course work taken at other institutions. Note that students are not eligible to study elsewhere during a period of academic (first or second) suspension or non-academic suspension. Some Mason colleges and schools may specify higher standards. The Permission to Study Elsewhere form can be found at registrar.gmu.edu.

Permission to Register as Graduate Student
Registration for courses in a graduate program is permitted only after the student has been notified of admission. Students admitted to degree programs are given preference over nondegree students through the registration process. Dual registration (for example, as a graduate student and nondegree enrollee) is not permitted. The graduate student is responsible for being properly registered and aware of all regulations and procedures required by a program of study. Regulations and degree requirements are not waived nor are exceptions granted because of ignorance of any regulations. Registration in graduate-level courses is restricted to admitted graduate degree students and nondegree graduate students (unless excluded by program). Undergraduate degree students may register for graduate courses only with special approval (see section below). Nondegree undergraduate students may not enroll in courses numbered 500 or above. Courses numbered 800 and above are available only to admitted graduate degree students.

**Graduate Course Enrollment by Undergraduates**

Courses numbered 700 and above are closed to undergraduates. Undergraduates in degree programs may enroll in graduate-level courses 500 to 699 only with written permission, which must be obtained before registration. Forms are available at registrar.gmu.edu. Written permission is waived for undergraduate students admitted to combined bachelor’s and accelerated master’s programs.

To enroll in graduate courses for credit applicable to an undergraduate degree, undergraduates must have completed all course prerequisites, have exhausted all upper-level undergraduate courses relevant to their educational objectives, and be able to demonstrate the level of maturity required for graduate courses.

Approval to register for reserve graduate credit (earned credit held in reserve to apply later toward a graduate degree) is given only to Mason seniors within 15 credits of completing undergraduate study who have successfully completed all course prerequisites. In addition, this privilege is normally extended only to seniors who have completed at least 12 credits at the university, have a cumulative GPA of 3.00 or better, and have a major in the department offering the course. Approval for reserve graduate credit is limited to 6 credits and does not imply approval for admission into a Mason graduate program or that credit earned will be accepted at another graduate school.

Undergraduates enrolled in graduate courses are eligible to receive only those letter grades applicable to graduate grading. For more information, see the Grading System section. Credit for the same course may not be applied to both graduate and undergraduate degrees.

**Special Registration for Nonenrolled Students**

Degree-seeking students not enrolled in a credit-bearing course but whose academic department certifies that they are pursuing an activity related to their Mason enrolled program can retain active status by registering for Special Registration (ZREG 200) for a $45 fee. Written approval from the student’s advisor and the academic department chair is required. Special registration allows students to retain library and computer privileges, receive a student ID, and buy a parking decal. Students must have active status to apply for or receive a degree, take an exam, or participate in cooperative education.

**Enrolling for Credit Without Grade Points**

Courses normally graded as satisfactory/no credit (S/NC) are annotated in the catalog, but students may elect to take credit without grade points. Undergraduates may take up to 6 credits to be graded S/NC; this option applies only to electives outside the field of the major, concentration, minor, general education requirement, or certificate program. Graduate students may elect the S/NC grade option only for courses that do not apply to the degree or certificate requirements. S/NC grading will also be used for courses numbered 998 and 999. For more information, see Additional Grade Notations in the Grading System section.

**Academic Common Market**

The Academic Common Market (ACM) is a cooperative tuition-reduction program agreement among 16 states, including Virginia, which compose the Southern Regional Education Board. Students who are not legal residents of Virginia but wish to
pursue a degree in a selected Mason program that is not available in their home state may be able to participate in the ACM and thereby attend Mason without incurring out-of-state tuition charges. Likewise, legal residents of Virginia may take advantage of programs in other states. More information about this program is available at the Office of the University Registrar or at registrar.gmu.edu/students/domicile/nonresidents.html.

University Consortium

Mason is a member of the Consortium of Universities of the Washington Metropolitan Area, which includes American University, The Catholic University of America, Corcoran College of Art and Design, Gallaudet University, The George Washington University, Georgetown University, Howard University, Marymount University, National Defense Intelligence College, National Defense University, Trinity Washington University, the University of the District of Columbia, and the University of Maryland-College Park. Eligible Mason students may enroll in courses at any of the consortium institutions. The consortium’s cross-registration arrangement permits students enrolled in eligible degree programs at one member institution to take a course at another member institution.

Participation in consortium cross registration is available to degree-seeking juniors, seniors, and graduate students in good standing and currently enrolled at Mason. Participation is limited to courses that are approved by the student’s department chair and dean, apply to the student’s program of study, are not offered during that semester at Mason, and have space available at the visited institution. Additional restrictions apply. Students may take one consortium course per semester, with a career maximum of 6 credits for undergraduates (9–12 if foreign language study is approved) and 6 credits for graduate students. Credit earned through the consortium is considered resident credit, so grades count in the Mason GPA.

Information and regulations, including restricted and excluded courses, for both outgoing and incoming Mason consortium students are available on the web at registrar.gmu.edu/consortium/index.html. Information pertaining to all member institutions is available at www.consortium.org. Questions may be directed to the consortium coordinator in the Office of the University Registrar at 703-993-2436.

Withdrawal

Selective Withdrawal for Undergraduates

Undergraduates enrolled in degree programs are eligible to withdraw from a limited number of classes without the dean’s approval and at the student’s own discretion. Students may process a maximum of three such selective withdrawals during their entire undergraduate career at Mason. The three classes may have any number of credits. The academic calendar for each semester will include an open withdrawal period beginning the day after the last day to drop the class and extending through the ninth week. For classes shorter than a semester (14 weeks), the period will be set in proportion to the length of the class.

Course Withdrawal with Dean Approval

For graduate and nondegree students, withdrawal after the last day to drop a course requires approval by the student’s academic dean, and is permitted only for nonacademic reasons that prevent course completion. For undergraduate students, withdrawal after the open withdrawal period, for cause within the period, or after a student has used all three selective withdrawals, requires approval by the student’s academic dean and is typically permitted only for nonacademic reasons that prevent course completion.

Semester Withdrawal with Dean Approval

Undergraduates taking three or fewer classes may use the selective withdrawal for all courses for a semester; see the Selective Withdrawal for Undergraduates section of this chapter. Otherwise, students may withdraw from a semester after the end of the drop period without academic penalty only for nonacademic reasons with the approval of the academic dean. Withdrawal forms are available at the appropriate academic dean’s office. Students who stop attending all classes without the dean’s approval and without processing selective withdrawals, if eligible, will receive a grade of F in all courses.
Effects of Course or Semester Withdrawal

Approved or selective withdrawal results in a grade of W on the student’s transcript for the withdrawn course(s). While a grade of W does not affect the GPA, undergraduate students should note that withdrawn courses are part of “attempted credit hours,” which serve as the basis for the student’s credit level. In the university’s undergraduate retention system, GPA standards increase according to credit level. See the Student Retention Categories in the Undergraduate Policies section.

Attendance Policies

Students are expected to attend the class periods of the courses for which they are registered. In-class participation is important not only to the individual student, but also to the class as a whole. Because class participation may be a factor in grading, instructors may use absence, tardiness, or early departure as de facto evidence of nonparticipation. Students who miss an exam with an acceptable excuse may be penalized according to the individual instructor’s grading policy, as stated in the course syllabus.

Absence for Religious Observances or Participation in University Activities

Mason encourages its faculty to make a reasonable effort to allow students to observe their religious holidays or to participate in university-sponsored activities (e.g., intercollegiate athletics, forensics team, dance company, etc.) without academic penalty. Absence from classes or exams for these reasons does not relieve students from responsibility for any part of the course work required during the absence. Students who miss classes, exams, or other assignments as a consequence of their religious observance or for participation in a university activity will be provided a reasonable alternative opportunity, consistent with class attendance policies stated in the syllabus, to make up the missed work. It is the obligation of students to provide faculty, within the first two weeks of the semester, with the dates of major religious holidays on which they will be absent, and the dates for which they are requesting an excused absence for participation in any university-sponsored activity scheduled prior to the start of the semester, and as soon as possible otherwise. Students requesting an excused absence for participation in a university-sponsored activity must provide their instructor with a letter from a university official stating the dates and times that participation in the activity would result in the student missing class. Faculty members are encouraged to take religious observances into consideration when constructing class schedules and syllabi.

Final Exams

Undergraduate courses usually culminate with a final exam. Except in predominantly laboratory courses, exams may not be given during the last week of classes. Exams may not exceed the scheduled length of two hours, 45 minutes. Changes in location or time of in-class final exams must be approved by the appropriate department chair and dean. A professor who is considering assigning a take-home exam or significant end-of-semester paper or project should inform the students at the beginning of the semester. Such assignments should be distributed by the beginning of the last week of classes so that students can coordinate them with preparation for other exams. Students must not be required to submit exams before the date of the regularly scheduled exam for a course. Retaking final exams is not permitted. Students who have more than one examination scheduled at the same time or more than two examinations scheduled on the same day should consult their instructors to explore whether they can make other arrangements. If campus-wide disruptions to class meeting schedules occur during the semester (e.g., due to severe weather), a revised final exam schedule may be issued. In this event, students and faculty are expected to adhere to the revised schedule.

Absences

Absences from final exams will not be excused by the instructor except for sickness on the day of the exam. Other causes must be approved by the student’s academic dean or director. The effect of an unexcused absence from an undergraduate final exam shall be determined by the weighted value of the exam as stated in the course syllabus provided by the instructor. If absence from a
graduate final exam is unexcused, the grade for the course is entered as F. See the Additional Grade Notations in the Grading System section for information on being absent with permission.

**Grading System**

University course work is measured in terms of quantity and quality. A credit normally represents one hour per week of lecture or recitation or not fewer than two hours per week of laboratory work throughout a semester. The number of credit hours is a measure of quantity, while the grade is a measure of quality. Faculty of record must assign a grade to all enrolled students at the end of the semester, term or part of term. For grades applicable to graduate courses, see the Graduate Policies section.

The university-wide system for undergraduate grading is as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Points</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>4.00</td>
<td>Passing</td>
</tr>
<tr>
<td>A</td>
<td>4.00</td>
<td>Passing</td>
</tr>
<tr>
<td>A-</td>
<td>3.67</td>
<td>Passing</td>
</tr>
<tr>
<td>B+</td>
<td>3.33</td>
<td>Passing</td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
<td>Passing</td>
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<tr>
<td>B-</td>
<td>2.67</td>
<td>Passing</td>
</tr>
<tr>
<td>C+</td>
<td>2.33</td>
<td>Passing</td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
<td>Passing</td>
</tr>
<tr>
<td>C-</td>
<td>1.67</td>
<td>Passing</td>
</tr>
<tr>
<td>D</td>
<td>1.00</td>
<td>Passing</td>
</tr>
<tr>
<td>F</td>
<td>0.00</td>
<td>Failing</td>
</tr>
</tbody>
</table>

No credit toward graduation accrues from a failing grade or a grade that is replaced by a retaken course.

**Additional Grade Notations**

*Satisfactory/No Credit (S/NC):* An S grade reflects satisfactory work (C or better for undergraduate students, B- or better for graduate students); otherwise, the student receives no credit (NC). S and NC have no effect on the student’s GPA. Entire courses normally graded S/NC are annotated in the catalog, and include doctoral dissertation courses 998 and 999. Students may also elect to take credit without grade. For more information, see Auditing a Course in the Registration Procedure section of this chapter.

*A/B/C/NC:* Students who successfully complete English Composition and Introduction to Literature (ENGH 101) or Composition for Non-Native Speakers of English (ENGH 100) are graded A, A-, B+, B, B-, or C. Students who do not attain at least a C in these courses receive no credit (NC). NC has no effect on the GPA.
Incomplete (IN): This grade may be given to students who are passing a course but who may be unable to complete scheduled course work for a cause beyond reasonable control. Unless the faculty member has specified an earlier deadline, the student must then complete all the requirements by the end of the ninth week of the next semester, not including summer term, and the instructor must turn in the final grade by the end of the 10th week. Faculty members who choose to require an earlier incomplete deadline will be required to file an Incomplete Grade Contract with the local academic unit's office, detailing the work that remains to be done, the general reason for the incomplete, and the student's grade at the point of receiving the incomplete. Unless an explicit written extension is filed with the Office of the University Registrar by the faculty deadline, the grade of IN is changed by the registrar to an F. The maximum IN extension is to the end of the same semester in which it was originally due. Students who have filed their intent to graduate have only six weeks from the date of degree conferral to resolve any incomplete grades and have the final grades recorded by the University Registrar's office.

While a grade of IN remains on the transcript, it is treated as an unsatisfactory grade in determining probation, suspension, termination, or dismissal. Removal of INs from the transcript may result in retroactive elimination of probation, suspension, termination, or dismissal.

Incomplete, extended (IX): IX is given by the Office of the University Registrar after receiving an Incomplete Extension form signed by the instructor and the appropriate dean. The extension gives students additional time to complete work; the amount of time is specified by the instructor. The final grade must be submitted to the University Registrar's office before final exams for the semester in which the IN grade was originally due. A grade of IX affects the academic record in the same way as does a grade of IN.

In Progress (IP): This grade may be given in selected courses, including graduate theses, dissertations, practicums, and internships. IP may also be used when the work of BIS 490 or a course that is graded S/NC or A/B/C/NC is not completed within one semester. IP has no effect on the GPA. With the exception of BIS 490, IP remains on the record until the work is completed and a final grade is assigned. An IP in BIS 490 not changed to a final grade by the last day of classes of the next semester, not including summer term, is changed by the Office of the University Registrar to an F. IP grades will also be awarded in courses numbered 799, 998 and 999 until successful completion, and then they will be changed to S/NC. Upon successful completion of 799, 998 or 999 and submission of the final grade, grades for all prior sections will be changed to S/NC.

Absent with permission (AB): A student who has received permission from the academic dean or director to be absent from a final exam for cause beyond reasonable control may receive a temporary grade of AB. A rescheduled exam must be administered within 10 business days of the original exam date, or the AB will automatically become an F. Final determination of academic status is not complete while the AB remains on the transcript.

Special Provision (SP): The grade of SP may be given by a dean to students who are unable to complete the course requirements because of extraordinary long-term circumstances, such as major illness or military deployment. SP has no effect on the GPA and remains on the transcript until the work is completed and a final grade is assigned.

Midterm Reports

Midterm progress is reported for all full-semester 100- and 200-level classes, and for 300- and 400-level classes at the discretion of the professor. The reporting period extends from the fifth through the eighth week of the semester, allowing flexibility to individual faculty in providing reports for their classes. Students should check with their instructors as to when reports will be complete and available for viewing through Patriot Web. These progress reports, which appear in Patriot Web as “Midterm Grades,” do not become part of the student’s official record. They are not calculated in any GPA, and they do not appear on any official or unofficial transcript.

Final Grades

Semester grade reports are available through Patriot Web. Students may print a grade report for their own records or to issue to a third party. Students may also order an official transcript through the Office of the University Registrar.

Transcripts
Official transcripts include all credit course work attempted at the university. Official transcripts will not be issued when unsatisfied financial obligations to the university exist. Unofficial transcripts may be printed by the student from Patriot Web. See registrar.gmu.edu for information and instructions on ordering official transcripts.

GPA

Quality point values are assigned to letter grades as indicated in the grading system table. A quality point score is computed by multiplying the value of a letter grade by the number of credits for the course. For example, a student receiving an A (4.00) in a 3-credit course earns 12 quality points. The GPA is computed by dividing the quality points earned by the number of credits graded A+ through F (GPA hours).

For undergraduates, the GPA computed for the current term gives the current GPA, which is the measure of academic performance in one semester and affects eligibility for the dean’s list. The GPA computed for all institutional credit gives the cumulative GPA, which is the basis for the university’s retention policies, including good standing, warning, probation, suspension, and dismissal. Cumulative GPA also determines students’ eligibility to graduate and have university honors posted to their record at graduation.

Current GPA and cumulative GPA do not apply to graduate students. A notation of academic warning is entered on the transcript of a graduate student who receives a grade of C, or a grade of F in a graduate course or while a grade of IN or IX is in effect. A degree GPA is computed for graduate students based on graded courses completed at the university and applied toward the degree. For more information, see the Graduate Policies section.

Change of Grade

The conditions and time limits for changes from the temporary grades IN, IP, AB, and SP to final grades appear in the Additional Grade Notations section.

Once a final grade has been recorded by the Office of the University Registrar, it can be changed only in cases of computational or recording error, or pursuant to a successful appeal of the grade as described below. Additional work of any type submitted to improve a grade after the final grade has been assigned and sent to the Office of the University Registrar is never accepted.

All changes of final grades must be initiated, approved, and recorded by the last day of classes of the next regular semester (spring for fall grades, and fall for spring and summer term grades).

Grade Appeals

Although faculty members are generally the best judges of student performance, there may be times when a student believes a grade is unfair. In such cases, the student should ask the faculty member to reconsider the grade. If the student is not satisfied, an appeal may be made to the head of the unit offering the course (the department chair, institute director, or designee). The recipient of the appeal should ask the student to return to the faculty member who assigned the grade for further consultation.

If the instructor is no longer associated with the university, the local administrator of the unit offering the course will appoint a faculty surrogate, who will assume magisterial authority of the instructor of record at this level of appeal.

If a mutually satisfactory agreement is not reached, the student may request that the chair form a committee of three faculty peers of the faculty member who assigned the grade. If the chair believes the student’s complaint is not legitimate, this reservation is reported to the chair’s supervisor, usually the dean. No review is conducted unless the dean believes the complaint has merit.

The faculty member or the student may challenge and have replaced one of the three members of the committee without giving a reason for the challenge. The committee meets separately with the faculty member and the student to explore the full particulars of the case. A nonparticipating observer of the student’s choice may attend the meeting. Every effort is made to avoid an adversarial relationship.
After the committee has reviewed the case thoroughly, it issues to the chair (with a copy to the faculty member) a written recommendation that includes the reasons for its findings. At this time, the faculty member has an opportunity to take the recommended action, if any. If the matter is not resolved at this point, the chair considers the committee recommendation and makes a recommendation to the dean. The decision of the dean is not subject to further appeal. If the dean decides that a change of grade is appropriate and the faculty member refuses to make the change, then the dean may direct the Office of the University Registrar to do so.

Grade appeals are not accepted after the last day of classes of the following semester (spring for fall grades, fall for spring and summer grades).

The Provost's Office does not consider grade appeals, nor does the University Academic Appeals Committee.

**Pending Grade Appeal for Students in Academic Difficulty**

A student may request a delay from the dean in imposing academic suspension because of a pending grade appeal that could change the student’s status. An approved delay allows the student to register.

If the grade appeal is successful, the official transcript is corrected and the student continues in classes as a student in good academic standing, on probation or on warning. If the grade appeal is not successful, the student is required to stop attending all classes immediately. No record of registration for the academic period appears on a transcript and the student receives the appropriate refund as of the decision date.
Undergraduate Policies

Return to: Academic Policies

- Student Classification
- Academic Advising
- Academic Standing
  (Academic period, good academic standing, student retention categories, termination from the major, academic suspension, academic dismissal, academic performance and credit limit, academic standing and student activities, academic clemency)
- Requirements for Undergraduate Programs
  (Declaration of major, change of academic program, credit for more than one undergraduate major, minors, undergraduate certificates, requirements for bachelor’s degrees, second bachelor’s degree)
- University Honors
- Dean’s List

Student Classification

Admitted undergraduates are classified as follows: freshman, 0–29 credits completed; sophomore, 30–59 credits completed; junior, 60–89 credits completed; and senior, 90 or more credits completed. Full-time undergraduates are classified as those students enrolled in 12 or more credits per semester. Please note that different criteria for full-time status may apply for tuition, verification, and financial aid purposes. For more information, contact the offices of Student Accounts, University Registrar, and Student Financial Aid, respectively.

Academic Advising

The mission of academic advising at Mason parallels the university’s mission by providing resources and programs to mentor, teach, and guide students in their decision making as they develop their educational and career goals. Admitted undergraduate students should meet regularly with an academic advisor to discuss academic programs, educational goals, and career plans. With their advisors, students plan academic programs to meet the general university degree requirements and specific requirements within their major fields. It is the student’s responsibility to read the catalog and know and fulfill the requirements of a specific baccalaureate degree. To assist in the advising process, Mason provides a computerized degree evaluation. Students should access their individualized reports through Patriot Web.

Individual departments establish their own advising processes; students should check with their departments for the appropriate procedures. During their freshman and sophomore years, students in the Honors College plan their schedules with honors advisors. Every department coordinates advising of its honors students through the Honors College.

Some departments require that students be advised prior to registration each semester. For the categories of students (regardless of major) who may not register until they have seen an advisor, see the Registration, Attendance, and Grading section of this chapter. An advisor locator is available at advising.gmu.edu/current-students/advisor-locator.

Academic Advising & Transfer Center
Student Union Building I, Room 3500, MS 2E6
Phone: 703-993-2470
Fax: 703-993-2478
Web: advising.gmu.edu
E-mail: advisor@gmu.edu
Admitted students who have not yet declared a major or are considering a change of major are assisted in the Academic Advising and Transfer Center. Students are encouraged to make an appointment for information about general education requirements, programs, policies, procedures, and other academic concerns. The Center also provides information and guidance for students who are interested in pre-professional programs in the health fields and to new transfer students who need assistance transitioning to Mason. Advising is available by appointment Monday through Friday, 9 a.m. until 5 p.m., and Tuesday until 7 p.m.

Student Academic Affairs, Advising & Retention
Student Union Building I, Room 3500, MS 2E6
Phone: 703-993-2470
Fax: 703-993-2478
Web: saa.gmu.edu

Student Academic Affairs, Advising & Retention is the umbrella unit for the Transition Resource Center, the Academic Advising and Transfer Center and pre-health advising. This unit rules on all academic actions submitted by undergraduate undeclared and nondegree students.

The unit also manages campus wide retention activities and the administration of MAP-Works, the student success system.

**Advising upon Entrance into Upper Division (Junior Standing)**

Upon entrance into the upper division, every student should meet with an advisor to adopt a program of study. This meeting should cover the following:

- Review of requirements for the degree and major the student has chosen
- Review of the student’s record including any deficiencies which must be corrected
- Discussion of career or graduate study options open to the student enrolled in such a program
- Opportunities for departmental faculty to evaluate the student’s suitability to major in the chosen discipline.

This advising session occurs in the semester in which the student will have completed 60 or more acceptable credits. The results are a matter of record, with any approved modifications being entered into the student’s computerized degree plan.

Although an upper-division student who has filed an approved program of study is usually not required to consult again with an academic advisor, it is good practice to seek periodic academic and career advising. It remains the student’s responsibility to seek approval for any program change so that the computerized degree plan may be kept current. In particular, once a student has completed 60 credits, a change of major requires an extended session with an advisor in the new major and approval of a new program of study before the change is complete.

A student in lower-division status may change majors by filing a Change/Declaration of Academic Program Form with the Office of the University Registrar. These are minimal advising procedures to be followed in all undergraduate segments of the university; individual units may require additional advising sessions.

**Health Professions Advising and the Medical Sciences Advisory Committee**
Student Union Building I, Room 3500, MS 2E6
Phone: 703-993-9305
Fax: 703-993-2478
Web: prehealth.gmu.edu

Students are responsible for educating themselves about a career in the health professions (e.g., dentistry, medicine, pharmacy, optometry, podiatry, or veterinary medicine) and should become familiar with the relevant graduate/professional admissions process. The health professions advisor coordinates academic and career advising for Mason students and alumni as the chair of the Medical Sciences Advisory Committee. The committee reviews all qualified candidates for admission to health profession programs in dentistry, podiatry, veterinary, allopathic, and osteopathic medicine to create a composite letter of evaluation for the applicant. The committee comprises university faculty and professional advising staff. For more information, consult the advising web site or contact the health professions advisor.
Academic Standing

The following system of academic progress became effective in fall 2004 and applies to all undergraduate degree and nondegree students at Mason.

Academic retention is based solely on the cumulative GPA. The cumulative GPA required for retention varies according to the credit level or attempted credit hours, which is a combination of all credits attempted at the university plus credits transferred from other institutions or obtained by testing.

Academic Period

Academic period refers to fall semester, spring semester, or summer term. For determining the duration of academic warning, probation, and suspension, an academic period is defined as follows:

Each academic period begins on the 15th day following the last scheduled day of final exams for the previous period. Each academic period ends on the 14th day after the last scheduled day of final exams. For example, assume that the last scheduled day of final exams for a semester is Monday, December 23. That period then ends on Monday, January 6. The next period begins on Tuesday, January 7.

Good Academic Standing

Students are in good academic standing unless they are academically dismissed, suspended, or on probation. Students on academic warning are still considered to be in good academic standing.

Student Retention Categories

The university’s minimum standard for satisfactory academic achievement is 2.00 on a 4.00 scale. Students with at least 7 attempted credits and a cumulative GPA of less than 2.00 fall into one of three categories: warning, probation, and suspension. All notations of academic standing are included in a student’s permanent record. The cumulative GPA range that defines each of the categories varies according to the credit level, as noted below:

<table>
<thead>
<tr>
<th>Credit Level Attempted Credit Hours</th>
<th>Warning Cumulative GPA Range</th>
<th>Probation Cumulative GPA Range</th>
<th>Suspension Cumulative GPA Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>7–16</td>
<td>0.00–1.99</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>17–29</td>
<td>1.75–1.99</td>
<td>1.00–1.74</td>
<td>0.00–0.99</td>
</tr>
<tr>
<td>30–59</td>
<td>1.85–1.99</td>
<td>1.25–1.84</td>
<td>0.00–1.24</td>
</tr>
<tr>
<td>60–89</td>
<td>1.95–1.99</td>
<td>1.55–1.94</td>
<td>0.00–1.54</td>
</tr>
<tr>
<td>90+</td>
<td>–</td>
<td>1.85–1.99</td>
<td>0.00–1.84</td>
</tr>
</tbody>
</table>

Exception for Freshmen and Transfer Students

Freshmen and transfer students in their first semester of study at Mason will receive probation as the strongest academic sanction. GPA retention levels, as stated above, will apply in all subsequent semesters. Students in this category should be on notice that they must make up ground in order to avoid suspension in future semesters; in particular they should consult their advisors and consider repeating courses in order to achieve academic good standing.
Termination from the Major

Undergraduate students in any retention category may be reviewed for possible termination by their dean. Termination from a major—or from all majors in a college—may be imposed as a result of excessive repeating of required courses without achieving the minimum standard, and for other evidence of continued failure to make adequate progress toward completion of the major. Students must be informed a semester in advance and given a chance to meet the standard or appeal. Once a termination decision has been made, a letter of termination is sent to the student by the dean or director of the school, college, or institute, and notification of termination from the major is affixed to the student’s academic record. Students who are terminated are no longer eligible to pursue that major, but may transfer to a different major within the university to complete their undergraduate degree.

Academic Suspension

Students in degree status who incur a first suspension following a spring semester or summer term serve a period of suspension through the next fall semester. Students who incur a first suspension following a fall semester serve a period of suspension through the next summer term. A second suspension is for one calendar year: two semesters and a summer term. Students returning from suspension are on probation for one academic period. Course credits earned at other colleges during the period of suspension from Mason (for academic or nonacademic reasons) are not accepted for the degree program.

Nondegree undergraduate students placed on suspension have no specified rights of return to the university. Nondegree students who have been suspended and wish to resume their studies after a period of absence must qualify for readmission through the Office of Admissions.

Academic Dismissal

A third suspension results in academic dismissal, a status that is usually permanent. In exceptional cases, students who have been dismissed may apply for readmission after a minimum absence of three calendar years from the university, but only if they meet one or more of the following conditions after having been dismissed:

- Demonstrate academic success (2.50 GPA or better) in at least 18 credits of classes taken during the period of dismissal at an accredited two- or four-year college or university. Such credits may be considered for transfer back to Mason, but there is no guarantee of acceptance of the credit.
- Provide other evidence of a renewed ability to achieve academic success.
- Provide evidence that all degree requirements will be met once an additional 12 or fewer credits are complete.

Meeting the above requirements does not guarantee a return. The Office of Admissions and the appropriate school or college dean will make individual decisions in the best academic interests of the student and the university. For students seeking readmission to a new school or college, the new dean will make the decision in consultation with the former dean and the Office of Admissions. For more information, see the Academic Clemency section of this chapter.

Academic Performance and Credit Limit

Undergraduate students on warning, probation, or returning from suspension are limited to a maximum of 13 credits for following semesters until they achieve good standing. Students registered for 14 or more credits are responsible for seeking academic advisement and adjusting their enrollment to a maximum of 13 credits.

Academic Standing and Student Activities

Only students in good academic standing are eligible to hold or run for elective or appointive office in any organization or activity associated with Mason, compete in any athletic or other activity representing Mason on either an intercollegiate or a club level, or serve as a working staff member of any student organization. Note that students on warning are considered to be in good standing. Some organizations and activities may impose stricter academic criteria for participation.
A student whose eligibility for an activity requires the completion of a semester will have fulfilled that requirement when the student’s publicly scheduled exams are over, unless continued eligibility depends on the grades received. In the latter case, the student will not become eligible until the end of the semester as defined in the Academic Period section of this chapter.

Academic Clemency

Undergraduate students returning to Mason after a separation of a minimum of three calendar years may petition their academic dean to have up to 16 previous credits earned at Mason removed from the calculation of their cumulative GPA. Courses and grades so removed will not count toward graduation requirements. Note that the courses, with their original grades and the notation “Academic Clemency,” will remain listed on the student’s transcript permanently. The petition for clemency must be filed within 12 months starting from the first day of the re-enrollment semester at Mason; approval may depend on successful completion of that semester. Approval of the request is neither automatic nor guaranteed.

Requirements for Undergraduate Programs

Declaration of Major

To plan a sound academic program, undergraduates should select a degree and major as soon as it is practical but no later than four weeks before the end of the sophomore year. To declare a major, students should confer with the appropriate advisor in the new major program. Students approaching the recommended point for declaring a major, but still uncertain of their choice, should consult the Academic Advising Center, Student Union Building I, Room 304, advisor@gmu.edu. Note that all degree components including general education, majors and concentrations must be contained in a single catalog year. See note under Catalog Requirements for Degrees for exception regarding minors.

Requirements for Bachelor’s Degrees

- **Admission.** Candidates must have been officially admitted into degree-seeking status.
- **Residency.** At least one-fourth of the total credits applied to the degree must be completed at Mason and include at least 12 upper-level credits (courses numbered 300 or above) in the major program. A maximum of 18 credits earned in non-degree status at Mason can be applied toward a bachelor’s degree.
- **Credit Hours.** Students must complete at least 120 credits that count toward graduation and fulfill all degree requirements. A few programs require more than the minimum 120 credits.
- **Quality.** Candidates must achieve a cumulative GPA of 2.00 or higher, and must meet all higher standards for grades allowable in majors, minors, or certificates. The Mason cumulative GPA does not include transfer courses.
- **Upper Level.** Students seeking a bachelor’s degree must apply at least 45 credits of upper-level courses (numbered 300 or above) toward graduation requirements.
- **University General Education.** Candidates must complete general education requirements as described for their catalog year. This includes satisfying the requirement of two semesters of English composition (ENGH 101 and ENGH 302) with a grade of C or better.
- **College/Department General Education.** Students must satisfy additional general education requirements for specific degree programs, as described in the college section of the catalog.
- **Writing-Intensive Course Requirement.** As part of the university’s commitment to student writers in all undergraduate programs, at least one upper-division course in each major has been designated as fulfilling the “writing-intensive” (WI) requirement.
- **Major.** Students must satisfy all requirements for their major and degree program, as described in the college section of the catalog, and as detailed in the degree evaluation for their catalog year.

English Composition Requirement
Mason requires students to complete at least two semesters of English composition. Students who complete the Honors Curriculum in General Education or the Mason Cornerstones program in New Century College complete the English composition requirement through coursework in those programs. Equivalent credit may be granted through course transfer or external exam. Exemption (but not credit) may be granted through a proficiency exam administered by the English department. All other students must enroll in ENGH 101 (or 100) upon admission and, after meeting its prerequisites, ENGH 302. Students must attain a minimum grade of C in composition courses to fulfill degree requirements.

**Writing-Intensive Course Requirement**

As part of the university’s commitment to student writers in all undergraduate programs, at least one upper-division course in each major has been designated as fulfilling the “writing-intensive” (WI) requirement. While other courses in the major may require written projects, teachers of the designated WI courses will devote class time to instruction on how to complete assignments successfully, assign and grade a minimum of 3500 words, provide constructive feedback on drafts, and allow revision of at least one graded assignment. See the description of each major for the specific course or courses that fulfill the WI requirement. A full list of writing intensive courses can be found on the Writing Across the Curriculum web site.

**Second Bachelor’s Degree**

A second bachelor’s degree may be earned, either concurrently or sequentially. To graduate with two degrees, students must present at least 30 Mason credits beyond those required by either degree alone. For sequential awarding of degrees, students must be readmitted for the second degree through the Office of Admissions and complete a minimum of 30 credit hours after that point to have fulfilled the residency requirement for that degree.

Students who are concurrently pursuing two bachelor’s degrees at Mason must present a detailed program of study for both degrees and obtain authorizing signatures from the chair or director of each degree program and the dean or director, if required by the college, school, or institute. Students may declare the second concurrent degree by completing the Declaration of Second Bachelor’s Degree section of the Change/Declaration of Academic Program Form. Both degrees must be declared the semester before the student intends to graduate. Students pursuing concurrent degrees should apply to graduate when both degrees are complete, or be prepared to meet the requirements noted above for sequential awarding of degrees.

**Minors**

Students may elect minor programs of study in addition to major fields by submitting a completed Minor Declaration (Undergraduate) form to the Office of the University Registrar. Minors usually require between 15 and 21 credits of study, at least 8 of which must be applied only to that minor and may not be used to fulfill requirements of the student’s major, concentration, an undergraduate certificate, or another minor. Students must complete at least 6 credits in their minor at Mason and achieve a minimum 2.00 GPA in courses applied to the minor. Students interested in a minor should consult the appropriate departmental chapters in this catalog.

**Undergraduate Certificates**

Students may elect undergraduate certificate programs of study in addition to major fields by submitting a completed Change/Declaration of Academic Program form to the Office of the University Registrar. Students pursuing undergraduate certificates must be admitted to Mason in degree-seeking status. Undergraduate certificate programs require at least 24 credits, 15 of which may not also be used to fulfill the requirements of a major, a concentration, a minor, or another undergraduate certificate. More than half of the credit hours for an undergraduate certificate must be taken at Mason, and more than half must be taken in degree-seeking status. Students must achieve at least a 2.00 GPA in courses applied to the certificate.

Students with a previous bachelor’s degree, who are admitted to an undergraduate certificate program alone, have four years to complete certificate requirements. Such students who are given permission to re-enroll following an absence from Mason may not count the four-year time limit as beginning on the date of re-enrollment. International students attending in F-1 or J-1 status have a more restrictive time limit; contact the Office of International Programs and Services for information. Students who will
not meet the published time limit because of circumstances beyond their control may petition their dean for an extension. Failure to meet the time limit or to secure approval of an extension request may result in termination from the program.

A completed undergraduate certificate may be posted to the transcript only after completion of a bachelor’s degree. Note that these are university minimum requirements; individual programs may have higher standards and/or more restrictive requirements.

**Change of Academic Program**

Students considering a change in their academic program (major or degree) are encouraged to see an advisor in the Academic Advising Center or a faculty advisor in their prospective discipline. Departmental chapters of this catalog describe requirements for acceptance. Students not meeting the requirements may appeal to the department chair for an exception.

Once a student has completed 60 credits, a change of major requires a meeting with an advisor in the new major before the change is complete. To file a change of major, signatures of advisors or designates in both the new and former major programs must be obtained on the Undergraduate Change/Declaration of Academic Program form which can be found at registrar.gmu.edu.

**Credit for More than One Undergraduate Major**

Students seeking to graduate with a BA or BS degree in two or more subjects must meet departmental requirements for the major in each field. For each major, at least 18 credits used to fulfill its requirements cannot be used to fulfill the requirements of another major, a concentration, a minor, or an undergraduate certificate.

Students pursuing two or more concurrent majors must complete the Second Major section of the Undergraduate Change/Declaration of Academic Program form, available at registrar.gmu.edu. The applicant must present a detailed program of study for both majors and obtain the authorizing signature from the chair or director of the second program and from the dean or director, if required by the college, school, or institute. When required by a specific academic unit, department chairs and deans or directors must also approve all changes to the programs of study. Students may begin a program at any time that permits completion before the anticipated graduation date.

**University Honors**

A student graduates with distinction from the University when at least 60 credits applied toward graduation are earned at Mason, and the student’s cumulative GPA is at least equal to one of three values: 3.90, summa cum laude; 3.70, magna cum laude; or 3.50, cum laude.

A student graduates with recognition from the university when between 45 and 59 (inclusive) credits applied toward graduation are earned at Mason, and the student’s cumulative GPA is at least 3.80.

**Dean’s List**

Students in degree status who take at least 6 credits in a semester and earn a semester GPA of 3.50 or higher merit placement on the Dean’s List. Courses subsequently repeated and excluded will not retroactively affect Dean’s List status. This notation will be placed on the individual’s permanent record.
Graduate Policies

Return to: Academic Policies

- Student Classification
- Full-time Classification
- Academic Advising
- Student Status
  (Change from nondegree status, removing provisional qualifier, permission to re-enroll, voluntary resignation from graduate academic program)
- Credit by Exam, Reduction or Transfer
  (Credit by external exam, reduction of credit, transfer of credit, permission to study elsewhere)
- Graduate Grading
- Graduate Academic Standing
  (Academic warning, academic termination, academic dismissal)
- Combined Bachelor’s and Accelerated Master’s Degrees
- Requirements for Graduate Certificates
- Requirements for Master’s Degrees
- Requirements for Doctoral Degrees

At the graduate level, Mason offers certificates and master’s and doctoral degrees. There are also a number of combined bachelor’s and accelerated master’s degree programs for academically strong undergraduates with a commitment to research.

Graduate Council

The Graduate Council is the governing body for all graduate academic policies and procedures. The council approves all new graduate programs; authorizes all graduate course work, policies, and degrees conferred by the university; and sets minimum standards for admission to and graduation from any graduate program. These are minimum standards that all programs must meet; individual programs may set and enforce higher standards. The Office of the Provost administers university graduate policies for the Graduate Council.

Graduate Faculty

The graduate faculty consists of all George Mason University tenured and tenure-track faculty. Other Mason faculty members, as well as individuals from outside the university, may be appointed to the graduate faculty by the Provost for a specified duration of time.

Student Classification

Students may access graduate classes and programs according to their status as nondegree or enrolled degree students. For more information, see the Admission chapter of this catalog.

Full-Time Classification

Graduate students are considered full time if they are enrolled in at least 9 graduate credits per semester or hold a full-time assistantship (total 20 hours a week) and are enrolled in at least 6 graduate credits per semester.
Master’s students may enroll in 1 credit of 799 and be considered full time only if they have completed 3 credits of 799 and the student along with their advisor and department chair certify each semester that the student is working full time on the thesis. See the Master’s Thesis section for more information regarding 799.

Doctoral students who are enrolled in dissertation credits (either 998 or 999) are considered full time if they are enrolled in at least 6 credits per semester, regardless of whether they hold an assistantship. Doctoral students who have advanced to candidacy and have completed the minimum number of credits required by the university and their degree program, including the minimum number of credits of 998 and 999, are considered full time if they are registered for at least 1 credit of 999 and the student along with their advisor and department chair certify each semester that they are working full time on the dissertation. See the Dissertation Registration section for more information regarding 998 and 999.

To be considered as full time under the aforementioned clauses, a student must complete and submit the appropriate forms to the Office of the University Registrar prior to the first day of classes for the semester.

Different requirements for full-time status may apply for tuition, verification, loan deferral, and financial aid. Contact Student Accounts, the Office of the University Registrar, and Student Financial Aid, respectively, for more information. Note that the official designation of time status for all students is determined by the Office of the University Registrar.

Academic Advising

When a student is admitted to graduate study, the student is assigned a faculty advisor by the academic program responsible for the student’s program of study. Registration for newly admitted graduate students, as well as continuing students, begins with a visit to the student’s academic advisor. There, the student can obtain information about specific courses and degree requirements and develop an individual program of study. Progress in an approved program of study is the shared responsibility of the student and the advisor. The graduate student is responsible for compliance with the policies and procedures of the college, school, or institute, and all applicable departmental requirements that govern the individual program of study. Students should consult with their advisors before registration each semester.

Student Status

Change from Nondegree Status

A student admitted for graduate study in nondegree status may apply to obtain degree status within the same program. All admission requirements (as defined by the student’s program for degree status) must be met, including official transcripts and letters of recommendation. If the student intends to use credits earned in nondegree status toward a degree, the credits must be approved on the Graduate Transfer of Credit Request form. The credit must have been earned within six years prior to first enrollment as an admitted student in the specific certificate or degree program, and a minimum grade of B (3.00) must have been earned. There is a limit on the number of credits that can be transferred when changing from nondegree to degree status; please see the applicable degree program for specific information.

Removing Provisional Qualifier

For policies concerning students admitted provisionally, see the Graduate Admission Policies section in the Admission chapter of this catalog.

Permission to Re-Enroll

Permission to re-enroll in a program must be obtained by all master’s and doctoral degree students who have failed to enroll in at least 1 credit of course work for two or more consecutive semesters at Mason. A program may allow a student to petition to graduate under any catalog in effect while the student was enrolled. All program components, including concentrations, must
appear in the catalog for the year selected. The final decision as to catalog year rests with the unit dean or director. The Graduate Reenrollment form is available at registrar.gmu.edu.

**Voluntary Resignation from Graduate Academic Program**

Degree-seeking students may officially resign from their academic program with the approval of their department or program chair and their dean. The Voluntary Resignation form must be approved by the student’s program and Student Accounts, then submitted to the Office of the University Registrar for notation on the transcript. Resignations after the drop period will result in grades of W on the student’s transcript for that semester, and removal from any future registered courses. Program resignation is final. Students who have been granted a resignation will not be able to register for any courses unless admitted to another degree program or nondegree status in a different program.

**Credit by Exam, Reduction or Transfer**

**Credit by External Exam**

Degree credit for satisfactory completion of an external exam is limited to those exams and achievement levels specifically approved by the Graduate Council.

**Reduction of Credit**

The number of credits required by a doctoral, master of fine arts, or master’s program of more than 39 credits may be reduced on the basis of a previously earned master’s degree. Reduction of credit requires the approval of the program director and the dean or director of the school, college, or institute. They determine whether the credits are eligible for reduction of credit and applicable to the degree program and the number of credits to be reduced. Reduction of credit is limited to a maximum of 30 credits in a doctoral program, 20 in an MFA program, and 18 in the MA in psychology concentration in school psychology, and derive from the degree requirements given below.

Students requesting a reduction of credit must supply official transcripts. For transcripts from outside the United States, students must supply an official transcript evaluation and an official translation for transcripts not in English if these documents were not supplied in the admission process. Reduction-of-credit requests from students who are admitted provisionally are not considered until the students have fulfilled the conditions of their admission and had the provisional qualifier removed from their records.

Credits used in reduction of credit are not subject to time limits, and the credits must have been applied to a previous degree. All the other conditions given above for eligibility of transfer of credit apply also to reduction of credits.

**Transfer of Credit**

Graduate credit earned prior to admission to a certificate, master’s, or doctoral program may be eligible to be transferred into the program and applied to the certificate or degree. Transfer of credit requires the approval of the program director and dean or director of the school, college, or institute. They will determine whether the credit is eligible for transfer and applicable to the specific certificate or degree program. Note that credits accepted for transfer do not compute into any Mason GPA. Limits on the number of credits that can be transferred derive from the degree requirements given below.

Credit is usually considered for transfer at the student’s request at the time of initial registration as a degree-seeking student. Students must supply official transcripts. For transcripts from outside the United States, students must supply an official transcript evaluation and an official translation for transcripts not in English if these documents were not supplied in the admission process. Credit transfer requests from students who are admitted provisionally are not considered until they have fulfilled the conditions of their admission and the provisional qualifier has been removed from their records.
To be eligible for transfer credit, the credit must be graduate credit earned at another accredited university, earned at another institution and recommended for graduate credit in the American Council on Education guidebook, or earned at Mason while in a nondegree status or enrolled through extended studies. The credit must have been earned within six years prior to first enrollment as an admitted student in the specific certificate or degree program, and a minimum grade of B (3.00) must have been earned. The course must be applicable toward a degree at the institution offering the course. Extension and in-service courses that are not intended by the institution offering the courses to be applied to a degree program are not eligible for transfer credit to Mason. The credits cannot have been previously applied toward a degree at another institution or Mason; however, up to 3 credits previously applied to a degree program at another institution may be transferred into a certificate program at Mason.

Permission to Study Elsewhere

Students enrolled in a degree program may take graduate courses at another accredited institution and apply these credits to a master’s or doctoral degree with prior approval. Approval must be secured in writing from the director of the graduate program and the dean or director of the school, college, or institute, and submitted to Mason’s Office of the University Registrar before registering at the other institution. Upon completion of the course, students must arrange for an official transcript to be submitted to Mason so that the credits may be transferred into their Mason degree program. These credits are subject to all the other conditions given above for transfer credit, including limits on numbers of credits that can be taken elsewhere. Note that credits accepted for transfer do not compute into any Mason GPA. Permission to take a course elsewhere does not exempt a graduate student from satisfying the degree requirements given below.

Enrolled, degree-seeking graduate students may be eligible to take a limited number of courses through the Consortium of Universities of the Washington Metropolitan Area. See the University Consortium section in the Registration, Attendance, and Grading chapter of this catalog. Credits earned through the consortium are considered resident, not transfer, credits, and are therefore not subject to transfer of credit conditions or limitations.

Graduate Grading

The university-wide system for grading graduate courses is as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Quality Points</th>
<th>Graduate Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>4.00</td>
<td>Satisfactory/Passing</td>
</tr>
<tr>
<td>A</td>
<td>4.00</td>
<td>Satisfactory/Passing</td>
</tr>
<tr>
<td>A-</td>
<td>3.67</td>
<td>Satisfactory/Passing</td>
</tr>
<tr>
<td>B+</td>
<td>3.33</td>
<td>Satisfactory/Passing</td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
<td>Satisfactory/Passing</td>
</tr>
<tr>
<td>B-</td>
<td>2.67</td>
<td>Satisfactory*/Passing</td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
<td>Unsatisfactory/Passing</td>
</tr>
<tr>
<td>F</td>
<td>0.00</td>
<td>Unsatisfactory/Failing</td>
</tr>
</tbody>
</table>

* Although a B- is a satisfactory grade for a course, students must maintain a 3.00 average in their degree program and present a 3.00 GPA on the courses listed on the graduation application.

Information about additional grade notations that apply to graduate students as well as undergraduates may be found in the Academic Policies section of the catalog under Grading System.
Graduate Academic Standing

Academic Warning

A notation of academic warning is entered on the transcript of a graduate student who receives a grade of C or F in a graduate course or while a grade of IN is in effect.

Academic Termination

<table>
<thead>
<tr>
<th>Student Status</th>
<th>Students may be terminated for any one of the following reasons:</th>
</tr>
</thead>
</table>
| Provisionally admitted degree seeking graduate students | 1. Fail to meet conditions of admission within time limits  
2. Fail to make satisfactory progress toward the degree, as determined by the academic unit  
3. Accumulate 12 credits of unsatisfactory grades in undergraduate courses  
4. Accumulate grades of F in two graduate courses or 9 credits of unsatisfactory grades in graduate courses  
[NOTE: undergraduate and graduate course grades are not combined to reach the termination threshold; they are considered separately.] |
| Non-degree graduate students                        | 1. Accumulate 12 credits of unsatisfactory grades in undergraduate courses  
2. Accumulate grades of F in two graduate courses or 9 credits of unsatisfactory grades in graduate courses |
| Fully admitted graduate students enrolled in degree and/or certificate program | 1. Fail to make satisfactory progress toward degree or certificate requirements, including expiration of time limit.  
[NOTE: Fully admitted graduate students who accumulate grades of F in two graduate courses or 9 credits of unsatisfactory grades in graduate courses qualify for dismissal, not termination.] |

Although the university will make every effort to notify students when their performance reaches the threshold for termination, each student is responsible for knowing the termination criteria, for knowing when their grades have met the standard and for initiating any appeal to their dean. Once the appeal period has expired, or the student’s appeal has been denied, a letter of termination is sent by the dean or director of the school, college, or institute, and notification of academic termination is affixed to the graduate student’s official record. Students who are terminated are no longer eligible to take courses in the program, but may apply to another degree program or may apply to take courses in other programs through non-degree studies.

Academic Dismissal

A degree-seeking graduate student is dismissed after accumulating grades of F in two courses or a total of 9 credits of unsatisfactory grades (C or below) in graduate courses. These are minimum standards of academic performance; some programs have higher standards. Although the university will make every effort to notify students when their performance reaches the threshold for dismissal, each student is responsible for knowing the dismissal criteria for degree-seeking graduate students at Mason, for knowing when their grades have met the standard, and for initiating any appeal to their dean. A student may also be dismissed for failure to meet other program requirements such as doctoral competence exams. Note that the university reserves the right to dismiss any student based on cancellation (by the testing administrator) of any test score required for admission. The notation of academic dismissal is affixed to the graduate student’s official record. A student who is dismissed may not take additional course work at Mason.
Combined Bachelor's and Accelerated Master's Degrees

The university offers a number of combined bachelor’s and accelerated master’s degree programs for academically strong Mason undergraduates with a commitment to research or graduate or professional studies. Students admitted into these programs may take a number of graduate courses in their field of study (with permission from their undergraduate and graduate advisors) after achieving 90 undergraduate credits and fulfilling all prerequisites. A maximum of 6 graduate credits completed with a 3.00 GPA or better in each course will apply to the undergraduate degree and give the student advanced standing in the related Mason master’s program. A maximum of 6 graduate credits may also be taken as reserve graduate credit and only applied to the master’s. See Graduate Course Enrollment by Undergraduates section in the Registration, Attendance, and Grading chapter of this catalog.

Students in an accelerated degree program must fulfill all university requirements for the master’s degree, including a minimum of 18 applicable graduate credits taken after the bachelor’s degree has been completed and posted to the student’s academic record. More information is available in the various schools and institutes. Admission is competitive; undergraduates are advised to inquire early in their undergraduate careers. Applications must be approved by the undergraduate coordinator in the student’s major program, the graduate coordinator in the graduate school or department, and the relevant graduate associate dean. The university waives the graduate application fee for Mason undergraduates.

Requirements for Graduate Certificates

Candidates must satisfy all applicable university requirements and all requirements established by the graduate certificate program faculty. Individual departmental graduate certificate requirements are listed under their academic departments in this catalog. Note that the following are university minimum requirements; individual programs may have higher standards and/or more restrictive requirements.

- Graduate certificate programs require a minimum of 12 graduate credits.
- Only graduate courses may apply toward the graduate certificate.
- A maximum of 3 graduate credits taken at another institution can be transferred into a graduate certificate program. See Credit by Exam or From Other Institutions section.
- Candidates must have a minimum GPA of 3.00 in course work presented on the certificate application, which may include no more than 3 credits of C. (Grades of C+, C-, and D do not apply to graduate courses.) The GPA calculation excludes transfer credits.
- Certificate students are subject to graduate termination and dismissal policies.

Students in Master’s or Doctoral Programs also Pursuing Graduate Certificates

Admission
Students must be admitted to the master's or doctoral program in degree status. They must also be admitted to the graduate certificate program at least one semester before completion of certificate requirements.

Course Work in Degree Status
More than half of the credits required for the certificate program must be taken in degree status for the master’s or doctoral degree.

Time Limits
The time limits coincide with the six-year time limit for master’s degrees or the six-year time limit for advancement to candidacy in a doctoral degree. Master’s and doctoral time limit rules apply.

Multiple Programs
Students may be enrolled in one graduate certificate program while they pursue a master's or doctoral degree. Students who have completed a graduate certificate may subsequently be approved to apply many of the credit hours for that one certificate to a
graduate degree, as long as they were taken within six years of official enrollment into the degree program. There is no limitation on the sharing of credits between the graduate degree and one certificate.

**Students in Graduate Certificate Programs Only**

**Admission**
Students pursuing graduate certificates must be admitted to Mason in degree-seeking status. Failure to make satisfactory progress (as determined by the academic unit) toward certificate requirements may result in termination from the certificate program.

**Course Work After Admission**
More than half of the credits required for the graduate certificate program must be taken after admission to that program.

**Time Limits**
The time limit for completion is six years from the date of admission to the graduate certificate program. International students attending in F-1 or J-1 status have more restrictive time limits; contact the Office of International Programs and Services for information. The time limit is not extended because of an absence and subsequent re-enrollment into the graduate certificate program. Failure to meet the time limit or to secure an extension request may result in termination from the program.

**Multiple Programs**
Students not admitted to any graduate degree program (master's or doctoral) may be admitted to two graduate certificate programs at the same time. The graduation application for each graduate certificate must include a minimum of 12 credits that apply only to that certificate and not to another. (Credits from only one certificate may be subsequently applied to a future degree program, subject to program approval and time limit.)

**Financial Aid for Students in Certificate Programs Only**

Not all certificate programs are eligible for Federal financial aid.

**Requirements for Master’s Degrees**

Candidates must satisfy all applicable university degree requirements and all requirements established by the master’s program faculty. Individual departmental degree requirements are listed under the respective master’s programs in this catalog. Programs may impose more stringent requirements.

- **Admission.** Candidates must have been officially admitted into degree status.
- **Credit Hours.** Candidates must earn a minimum of 30 graduate credits.
- **Credit Level.** Only graduate courses may apply toward the degree.
- **Institutional Credit.** The majority of the credits applied to the degree must be earned at Mason or, in the case of programs offered through joint, cooperative, or consortial arrangements, at the participating institutions.
- **Residency.** A minimum of 18 credits must be taken in degree status, after admission to the degree program.
- **Thesis/Project Limits.** A maximum of 6 credits of master’s thesis research (799) or master’s project may be applied to the degree.
- **Quality.** Candidates must have a minimum GPA of 3.00 in course work presented on the degree application, which may include no more than 6 credits of C. (Grades of C+, C-, or D do not apply to graduate courses. The GPA calculation excludes all transfer courses and Mason nondegree studies credits not formally approved for the degree.)

**Thesis Options**

Requirements regarding a thesis vary with the degree program. A number of master’s programs offer both thesis and nonthesis options. The same quality of work is expected of students regardless of their chosen option. For more information, consult the section on degree requirements under each degree program.
Time Limit

Master’s degree students have six years from the time of first enrollment as a degree-seeking student to complete their degrees. Individual master’s programs may have stricter time limits, which are published in this catalog. International students attending in F-1 or J-1 status also have more restrictive time limits; contact the Office of International Programs and Services for information. Students who are given permission to re-enroll following an absence from Mason may not count the six-year time limit as beginning on the date of re-enrollment. Students who will not meet published time limits because of circumstances beyond their control may petition for an extension. Failure to meet the time limits or to secure approval of an extension request may result in termination from the program.

Master’s Thesis

When a thesis proposal has been approved by the appropriate department, the department chair sends the collegiate dean or director a copy of the thesis proposal, including the approval signatures of the master’s thesis committee members. Students may enroll in thesis research (799) at the beginning of the next semester. Students must register for a minimum of three credit hours in their first semester of 799. After that semester, students may enroll for one credit of 799 per semester and be considered full time if the following requirement is met: the student, advisor and department chair must certify each semester that the student is working full time on the thesis. Please note: Master’s students must maintain continuous enrollment in 799 while writing and submitting a thesis. Students registered in 799 are graded IP until work is complete; at that time they are graded S/NC, and previous IP grades are updated by the Office of the University Registrar to reflect the final S or NC grade. Graduation candidates who miss the library deadline for thesis submission, but do submit officially before the next semester begins, do not have to register for 799 in that next semester, but must stay active to graduate.

The master’s thesis committee is composed of at least three members of the graduate faculty, at least two of whom must be from the student's department or program. Faculty who are not members of the graduate faculty or other appropriate persons not affiliated with the university may serve as additional members. Committee members are appointed by the chair or director of the academic unit or program, or designee, after consultation with the student's adviser and the student.

The thesis committee chair is primarily responsible for directing the candidate’s research and writing activities. The student is responsible for keeping all committee members informed of the scope, plan, and progress of the research as well as the writing of the thesis.

Students selecting the thesis option should obtain a copy of Mason’s Thesis, Dissertation, or Project Guide, which is available at thesis.gmu.edu. Students may register in 799 only after their thesis proposal has been submitted and approved as prescribed in the guide. Any student not in attendance at Mason who is preparing a thesis under the active supervision of a member of the faculty or wishes to take an exam must maintain continuous registration in 799 for at least 1 credit per semester.

Thesis Submission

The university has a policy on the dissemination of scholarly works created by graduate students. The Electronic Thesis and Dissertation (ETDs) program encourages masters-level graduate students to submit an electronic copy of their thesis for broad scholarly dissemination through the Mason Archival Repository Service (MARS). Student participation in the ETDs program is strongly encouraged, but not mandatory. All students choosing to participate in this program will be required to sign the MARS Author/Contributor Permission Agreement.

On or before the thesis deadline for any semester, the student will submit a complete (signed Signature Sheet through Curriculum Vitae) 100% cotton copy of his or her thesis to the University Libraries along with a transmittal sheet. The student may also opt to submit an electronic copy of his/her thesis. These submissions can be in Word, WordPerfect, or in portable document format (PDF). Media formats (tiff, jpeg, png, wav, avi, mpeg, mov, rm, wmv, wma, etc.) for supporting materials will also be accepted. Datasets may be accepted at the discretion of the libraries. The files may be submitted on CD, DVD, or USB memory device. Please note that those students opting out of the ETDs program are required to submit two 100% cotton copies of their thesis.
For degree conferral in a particular semester, the above materials must be submitted to the library by 5 p.m. on the last Friday of classes in that semester. For specific deadlines and other information, go to registrar.gmu.edu.

Doctoral Students Also Pursuing a First Master’s Degree

Requirements for master’s degrees apply with the following exceptions. Residency derives from the doctoral degree requirements. Time limit may derive from the doctoral requirements, although programs may reject course work that is not sufficiently current. Students must be officially admitted to degree status in the master’s program a full semester before the one in which they will complete master’s degree requirements, i.e. admitted in fall for graduation the following spring.

Requirements for Doctoral Degrees

Candidates must satisfy all applicable university degree requirements and all requirements established by the doctoral program faculty. Departmental degree requirements are listed under the respective doctoral programs in this catalog. Programs may impose more stringent requirements.

- Admission. Students must have been fully admitted into degree status.
- Credit Hours. Candidates must earn a minimum of 72 graduate credits, which may be reduced by a maximum of 30 credits from a completed master’s degree or other suitable, approved transfer work. (see Credit by Exam, Reduction or Transfer)
- Degree Credit. The remaining 42 credits for students with a master’s degree may apply only to the doctoral degree and not to a second master’s degree.
- Credit Level. Only graduate courses may apply toward the degree.
- Institutional Credit. More than half of all credits applied to the doctoral degree (minimum 72) must be earned at Mason or in the case of programs offered through joint, cooperative, or consortium arrangements, at the participating institutions.
- Residency. More than half of all credits (minimum 72) must be taken in doctoral degree status, after admission to the degree program.
- Candidacy. Candidates must pass a written or oral doctoral candidacy (qualifying) exam, or both.
- Dissertation. Candidates must complete a minimum of 12 credits of doctoral proposal (998) and doctoral dissertation research (999), including at least three credits of 999. A maximum of 24 credits of 998 and 999 may be applied to the degree.
- Quality. Candidates must have a minimum GPA of 3.00 in course work presented on the degree application, which may include no more than 6 credits of C. (Grades of C+, C-, or D do not apply to graduate courses. The GPA calculation excludes all transfer courses and Mason extended studies or nondegree credits not formally approved for the degree.)

Time Limit

Total time to degree will not exceed eleven (11) calendar years from the time of first enrollment as a doctoral degree-seeking student. Doctoral students are expected to advance to candidacy in no more than six years and to complete all other degree requirements for graduation in no more than five years from the time of advancement to candidacy. Students who will not meet published time limits because of circumstances beyond their control may petition for an extension. Extensions to the time limit for advancement to candidacy may be granted for a maximum period of one calendar year. The one year extension granted to advance to candidacy will run concurrently with the five years provided to complete the dissertation. The total time limit to degree will not exceed eleven (11) years even for those students granted a time extension for advancement to candidacy. Students who are given permission to re-enroll following an absence from Mason may not count the time limits as beginning on the date of re-enrollment. Failure to meet the time limits or to secure approval of an extension request may result in termination from the program. International students attending in F-1 or J-1 status also have more restrictive limits to advance to candidacy and to
complete the degree, and cannot expect the maximum 11 year deadline to apply to them. Students should contact the Office of International Programs and Services for information.

**Doctoral Research Skill Requirements**

Some doctoral degree programs require demonstration of proficiency in a research skill, including knowledge of the research literature in a foreign language, computer language, statistical methods, or a research tool specific to the discipline. Research skill requirements are included with the degree requirements for the specific doctoral degree. Where demonstration of research skills is required, certification that this requirement has been met must be completed for advancement to candidacy.

**Program of Study**

Usually before the end of the second year of graduate study but no later than consideration for advancement to candidacy, doctoral students must submit a program of study for approval by the dean or director of the college, school, or institute. The program of study must include major courses and supporting courses to be completed, research skills required, subject areas to be covered by the candidacy exam, and a proposed date for the candidacy exam. Program of Study Forms are available from each program’s doctoral coordinator. Any changes in the programs of study must be documented with an amended Program of Study Form.

**Advancement to Candidacy**

Advancement to candidacy implies that a doctoral student has demonstrated both a breadth and a depth of knowledge in the field of study and is capable of exploring problems on the boundaries of knowledge, and has identified a research area that is likely to lead to a successful dissertation. The candidacy exam includes a written part and may include an oral part, depending on the particular doctoral program. Doctoral students should consult the degree requirements for each doctoral program to determine whether an oral portion is required, whether it is judged separately or with the written portion, the number of times a failed candidacy exam may be repeated and any associated time limits, and any time limits for attempting the candidacy exam.

Before doctoral students may be advanced to candidacy by the unit dean or director, they must have completed all course work as indicated on the approved program of study, been certified in all doctoral research skills required, passed the candidacy exam, and been recommended by the doctoral supervisory committee or program coordinator. Students advanced to candidacy after the add period for a given semester must wait until the following semester to register for 999 Dissertation Research.

**Dissertation Committee**

Before a doctoral student is advanced to candidacy, the dean or director of the school, college, or institute or its designee (as specified by the school/college/institute) appoints a dissertation committee upon recommendation of the student’s dissertation chair. Students work collaboratively with the program director and faculty to form the dissertation committee, with the understanding that some areas of research may be impossible to support due to available faculty expertise. Program personnel will facilitate the formation of the dissertation committee to the extent possible, but there can be no guarantee of successful formation.

All dissertation committees must consist of at least three members of the graduate faculty, at least two of whom must be from the student’s academic unit or program faculty. The committee consists of a dissertation chair, typically a graduate faculty member from the department or program of the student’s field of study and at least two other members of the graduate faculty. Only a graduate faculty member with a full-time appointment at George Mason University may serve as dissertation chair. Other Mason faculty, as well as individuals from outside the university, may be appointed as additional members to the committee. Such appointments are made where the additional member’s expertise and contribution add value to the dissertation, but appointment does not require graduate faculty status.
Student-initiated changes in the composition of the dissertation committee may occur only with the approval of the dean or director of the school, college, or institute or its designee in consultation with the committee. Faculty may resign from a dissertation committee with appropriate notice by submitting a written resignation.

**Dissertation Registration (998, 999)**

Students working on dissertation research (999) must register for a minimum of 3 credits of 999 per semester (excluding summers) until they have completed the minimum number of credits of 998 and 999 required by the university and their degree program. Then, they must register for 1 credit of 999 until the dissertation is complete and has been officially submitted to the library. See the Full-time classification section for more information. Students registered in 998 or 999 are graded IP until work in 998 or 999, respectively, is complete; at that time they are graded S/NC, and previous IP grades are updated by the Office of the University Registrar to reflect the final S or NC grade.

All registration for doctoral dissertation research (999) must be planned with the dissertation director and approved by the dean or director of the school, college, or institute. Dissertation research (999) is open only to doctoral students who have advanced to candidacy. Once enrolled in 999, students must maintain continuous registration in 999 each semester until graduation, excluding summers. Students who defend in the summer must be registered for at least 1 credit of 999 in the summer. Individual doctoral programs may require continuous registration beginning with 998. Graduation candidates who miss the library deadline for dissertation submission, but do submit officially before the next semester begins, do not have to register for 999 in that next semester, but must stay active to graduate.

It is the student’s responsibility to complete registration for dissertation proposal (998) or research (999) prior to the first day of classes for the semester. If this date is missed, students must still enroll in these courses via Add or Late Schedule Adjustment procedures and are subject to Late Registration fees. Failing to register on time in a particular semester does not alter the requirement for continuous registration in 999.

**Doctoral Dissertation**

A dissertation is required for the doctor of philosophy degree and most professional doctoral degrees. The dissertation is a written piece of original thinking that demonstrates doctoral candidates’ mastery of subject matter, methodologies, and conceptual foundations in their chosen field of study. This is generally achieved through consideration of a problem on the boundaries of knowledge in the discipline.

The director of the dissertation committee is primarily responsible for directing the doctoral candidate’s research and guiding the preparation of the written dissertation. After the dissertation committee is appointed, the student should begin discussions with the director to define a suitable problem for the dissertation. Before the student may enroll in doctoral dissertation research (999), the dissertation proposal must be approved by the dissertation committee and evidence of approval sent to the unit dean or director for approval. Before that time, the student may enroll in proposal research (998).

Guidelines for the content and general format of doctoral dissertations are in the *Thesis, Dissertation, or Project Guide*, which is available at thesis.gmu.edu. Consult a doctoral coordinator to determine which additional reference manuals are suitable.

**Doctoral Defense**

As soon as all degree requirements have been satisfied, including completion of the doctoral dissertation, the doctoral candidate may request a doctoral defense. Approval for the defense is given by the doctoral dissertation committee, department or program chair, and relevant dean or director of the school, college, or institute. Notice of a defense must be circulated to the university community two weeks before the defense date. The public defense should demonstrate the candidate’s maturity of judgment and intellectual command of the chosen branches of the field of study.

At the close of the final defense, the dissertation committee makes final judgments for approving the dissertation. The doctoral candidate is responsible for making all required changes promptly, submitting the original and required copies, and obtaining
signatures. Final approval for the dissertation is given by the doctoral dissertation committee, department or program chair, and the relevant dean or director of the school, college, or institute, all of whom must sign the final copy.

For a dissertation to be approved, all members of the committee must sign. If a committee member refuses to do so, the student or any member of the committee may petition the unit dean or director for a review and ruling. The dean or director may seek the advice of outside reviewers to provide an assessment of the work. The final decision is that of the dean or director, and is not subject to appeal.

**Dissertation Submission and Fees**

The university has a policy on the dissemination of scholarly works created by graduate students. The Electronic Thesis and Dissertation (ETDs) program encourages doctoral-level graduate students to submit an electronic copy of their dissertation for broad scholarly dissemination through the Mason Archival Repository Service (MARS). Student participation in the ETDs program is strongly encouraged, but not mandatory. All students choosing to participate in this program will be required to sign the MARS Author/Contributor Permission Agreement.

On or before the dissertation deadline for any semester, the student will submit a complete (signed Signature Sheet through Curriculum Vitae) 100% cotton copy of his or her dissertation to the University Libraries along with a transmittal sheet. The student will also submit an electronic copy of his or her dissertation. These submissions can be in Word, WordPerfect, or in portable document format (PDF). Media formats (tiff, jpeg, png, wav, avi, mpeg, mov, rm, wmv, wma, etc.) will be accepted. Datasets may be accepted at the discretion of the libraries. The files may be turned in on CD, DVD, or USB memory device. **Please note that those students opting out of the ETDs program are required to submit two 100% cotton copies of their dissertation.**

Submission of an additional PDF on CD of the dissertation to University Microfilms International (ProQuest) is required; a fee of either $55 or $150 (depending on publishing option chosen) is paid by the student for this process. Submission of a completed Survey of Earned Doctorates is also required. All copies of the dissertation must be submitted and all fees paid before the doctoral degree is awarded.

For degree conferral in a particular semester, the above materials must be submitted to the library by 5 p.m. on the last Friday of classes in that semester. (For specific deadlines and more information, go to registrar.gmu.edu). To be included in Mason’s published commencement program, doctoral students must submit materials to the library by the commencement program deadline.

**University Dissertation and Thesis Services**

University Dissertation and Thesis Services (UDTS) facilitates completion and submission of dissertations, theses, and graduate-level projects. The program assists Mason students in all stages of production. The UDTS web site, thesis.gmu.edu, provides students with useful tools, including downloadable templates of necessary elements, forms required for the submission process, and links to related web sites. Students completing a thesis or dissertation are required to complete a format review. UDTS is located in Fenwick Library, Special Collections and Archives, Wing 2C. For more information, contact the university dissertation and thesis coordinator at 703-993-2222.
Degree Application, Conferral and Commencement

Return to: Academic Policies

- Application for Degree
- Degree Conferral
- Commencement

Application for Degree

In the semester prior to the expected completion of degree requirements, students must confirm their intent to graduate through Patriot Web. The deadline to apply to graduate is generally three to four months prior to the conferral date. Specific deadlines and complete instructions regarding graduation are published on the Office of the University Registrar's web site registrar.gmu.edu. Separate applications for each graduate degree or certificate are required.

For a degree to be conferred, all course work must be completed, even if the course work is not being applied to the degree. All students must complete the following degree requirements prior to the conferral (graduation) date: internships, credit-by-exam, oral exams, theses, scholarly papers, and comprehensive exams. Master’s theses and doctoral dissertations are due in the library well before the conferral date. For more information, go to thesis.gmu.edu.

Students must have active registration status in the semester or summer term of graduation. Students not registered for course work in the term of graduation must obtain a special registration. (For more information, see the Registration, Attendance, and Grading section of this chapter.) Degree applications will not be automatically extended if graduation is postponed; students must reapply for each conferral date.

Degree Conferral

Mason awards degrees and certificates in programs and at levels authorized by the State Council of Higher Education for Virginia (SCHEV). The university confers degrees at the bachelor’s, master’s, and doctoral levels. An academic program may include a degree program and additional majors, minors, or certificates. The university offers no certificate program below the bachelor level; some post baccalaureate certificates, however, may be awarded concurrently with the bachelor’s degree. For more information, see the Programs of Study listings.

Definitions of Degree Components

- **Degree program, major, or field:** A program of study that normally requires at least 30 credits of course work in the specified field. The primary program name (degree and major or field) appears on the diploma for bachelor’s and master’s degrees. Only the degree name appears for doctoral degrees. An undergraduate who desires to graduate with a BA or BS degree in two or more subjects must meet departmental requirements for the major in each field. For each major, at least 18 credits used to fulfill its requirements must be applied only to that major, i.e., cannot be used to fulfill the requirements of a concentration, minor, undergraduate certificate, or another major.

- **Concentration:** A second-order component of a degree program or a component of a track. A concentration consists of at least 12 hours that are not applied to any other concentration. Undergraduate concentrations are approved by the unit at the undergraduate level or by the Graduate Council at the graduate level.

- **Certificate:** A nondegree program complementary to a degree that requires at least 24 undergraduate or 12 graduate credits. For each undergraduate certificate, at least 15 credits used to fulfill its requirements cannot be used to fulfill the requirements of a major, concentration, minor, or another undergraduate certificate. The name of a completed certificate program appears on the transcript after the conferral of an undergraduate degree. Certificates are approved
by the school or college at the undergraduate level and by the Graduate Council at the graduate level. Credits from a
maximum of one graduate certificate may also apply to a master's or doctoral degree program.

- **Minor:** A complement to a bachelor’s degree program or major normally requiring at least 15 credits in a field other
than the student’s major. Of the courses presented for a minor, at least 8 credits must be applied only to that minor and
may not be used to fulfill requirements of the student’s major, concentration, an undergraduate certificate, or another
minor.

- **Option:** The choice of a thesis or nonthesis path in graduate programs.

### Catalog Requirements for Degrees

Catalog year refers to the setting of course and non-course requirements within academic programs as stated in the school and
college section of a specific catalog. Catalog year does not set academic policies other than program requirements in place,
however. For more information, see the Knowledge of University Policies section of the Student Rights and Responsibilities
section. Not all programs and degree components are available in all catalogs. For any one degree, all requirements must be met
as stated in a single catalog. The only exception is that Bachelor's degree students may select a minor from another catalog year
for which they are eligible, as noted below.

Bachelor’s degree candidates may choose to graduate under the terms of any catalog in effect during their enrollment in degree
status. Students who have been inactive for five or more years or who have attended another institution without prior approval
from their academic dean or director must graduate under a catalog in effect at or after their re-admission and during their
enrollment in degree status.

Master’s and doctoral degree candidates who have been continuously enrolled may choose to graduate under the terms of any
catalog in effect during their enrollment in degree status. Students who have been inactive more than one year, however, may be
required by their program to graduate under a catalog in effect after they have been granted permission to re-enroll. In no case
may a student choose the requirements of a future catalog year that take effect after the student's degree is anticipated.

### Commencement

Commencement provides an opportunity for students and their families to share in the conferral of academic degrees. Students
who wish to participate should check the web site at events.gmu.edu for current information about all Commencement details
including tickets, regalia, and schedules. Note that there is only one commencement ceremony each year, in May. Bachelor’s and
master’s degree candidates who declare their intent to graduate in August but who have not yet completed all degree
requirements may participate in the commencement ceremony in anticipation of degree completion. Their names are marked with
an asterisk identifying them as candidates pending completion of all requirements. Doctoral students may participate only if they
have successfully completed all degree requirements, including defending and submitting a signed, final copy of their dissertation
by the deadline.
Research

Human Subjects Research

All research activities involving human subjects or data regarding human subjects that are conducted by faculty, staff, or students and/or that involve faculty, staff, or students as participants must be submitted to the Office of Research Subject Protections for review and approval. Further information and forms for submission can be found at www.gmu.edu/research/ORSP/HumanSubjects.html. All research activities must be approved by the Human Subjects Review Board prior to implementation of the activity. Separate approval by the vice provost for academic affairs is required if contact information for Mason students is needed to conduct the research. All student research must be supervised by a faculty member. The faculty member will serve as the principal investigator for the research and will assume responsibility for the legal and ethical conduct of the work.

Animal Use in Research

All work with live animals, whether for research, teaching, or testing, must be approved by the Institutional Animal Care and Use Committee (IACUC) prior to initiation of the work. All care and use of animals at Mason must be carried out under the supervision of a faculty member who is qualified and experienced in the work being conducted and assumes responsibility for legal and ethical conduct. Further information and submission forms can be found at the Office of Research Subject Protections web site at www.gmu.edu/research/ORSP/AnimalCareAndUse.html.
Student Rights and Responsibilities

- Policies and Procedures Affecting All Students
- Official Communication with Students
- Student Requests for Academic Actions
- Privacy of Student Records
- Academic Assessment
- Honor System and Code
- Human Subjects Research
- Animal Use in Research
- Student Work, Intellectual Property
- Conduct within the University Community
- Student Health Services
- Drug and Alcohol Policy
- General Policies to include Equal Opportunity, Non Discrimination, Sexual Harassment, Reasonable Accommodation, Responsible Use of Computing, Parking Policy, Sexual Assault, Stalking and Other Regulations

Policies and Procedures Affecting All Students

Knowledge of University Policies

Each student is responsible for knowing Mason’s rules, regulations, requirements, administrative policies and Academic Policies. This catalog is the normal repository of academic policy statements, but corrections, changes, or interpretations can be promulgated by other means, including electronic publication.

When the university or one of its academic units changes course requirements, grading procedures, or criteria for acceptance into particular programs, academic standing, or graduation, the changes apply to all students enrolled at the time of implementation of the change and thereafter.

Students have certain choices regarding the set of degree requirements under which they graduate, as detailed in the Catalog Requirements for Degrees in the Degree Application, Conferral and Commencement section. The Special Collections and Archives section of the Fenwick Library has copies of all previous catalogs. They may not be checked out, but may be photocopied. Any student in doubt about an academic matter should consult a faculty advisor or dean.

*Students are subject to the university’s stated policies regarding patents and copyrights. These policies are available at www.gmu.edu/research/OSP/Policies.html.*

Catalog Requirements for Degrees

Catalog year refers to the setting of course and non-course requirements within academic programs as stated in the school and college section of a specific catalog. Catalog year does not set academic policies other than program requirements in place, however. Not all programs and degree components are available in all catalogs. For any one degree, all requirements must be met as stated in a single catalog. The only exception is that Bachelor's degree students may select a minor from another catalog year for which they are eligible, as noted below.
Bachelor’s degree candidates may choose to graduate under the terms of any catalog in effect during their enrollment in degree status. Students who have been inactive for five or more years or who have attended another institution without prior approval from their academic dean or director must graduate under a catalog in effect at or after their re-admission and during their enrollment in degree status.

Master’s and doctoral degree candidates who have been continuously enrolled may choose to graduate under the terms of any catalog in effect during their enrollment in degree status. Students who have been inactive more than one year, however, may be required by their program to graduate under a catalog in effect after they have been granted permission to re-enroll. In no case may a student choose the requirements of a future catalog year that take effect after the student's degree is anticipated.

Official Communication with Students
Web: masonlive.gmu.edu

Mason uses electronic mail to provide official information to students. Examples include notices from the library, notices about academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their Mason e-mail account and are required to activate that account and check it regularly. Students are also expected to maintain an active and accurate mailing address in order to receive communications sent through the United States Postal Service.

Student Requests for Academic Actions

All requests for academic actions, such as special permissions or exceptions to published academic regulations, must be submitted to the head of the unit in which the student’s program is housed, for example, the department chair, institute director, or school or college dean. Forms and instructions on how to initiate an academic action are available in the academic unit and on the unit’s web site. For students who have not yet declared a major, the academic actions process is executed in the Office of Student Academic Affairs, Advising & Retention, SUB I, Room 3500. Students will be informed of the average wait time for decisions on academic actions undertaken within their units. Those who need assistance with the academic actions process may consult their academic advisor, or they may be directed to the university ombudsman.

Appeals of Academic Procedures

Students have the right to appeal decisions regarding requests for academic actions. The appeals process begins in the academic unit. Each college, school, and institute at Mason has a written statement of that unit's appeal process on file in the dean or director's office. Students who feel the appeals process was conducted unfairly by a college or school may appeal to the Provost’s Office. All appeals must be in writing, and they must demonstrate that the student has exhausted all options within the academic unit. Undergraduate students initiate appeals of unit decisions with the Associate Provost for Undergraduate Education. Graduate students initiate appeals of unit decisions with the Associate Provost for Graduate Education. The Provost's Office does not consider grade appeals or appeals of Honor Committee decisions.

The Provost’s Office may refer cases to the University Academic Appeals Committee. The committee consists of five faculty members, including at least one member of the Faculty Senate and the provost (or designee), who serves ex officio, in a nonvoting capacity. The committee hears only those cases where procedural irregularities or a questionable application of university policies is demonstrable, or when the provost or the committee deems the case relevant to the application of university-wide policies. The burden of proof rests with the student, who must provide clear and convincing documentation to support the contention that the decision was unfair based on the criteria stated above. The committee’s decision is final. The University Academic Appeals Committee is not charged to hear grade appeals or appeals of Honor Committee decisions.

The Provost’s Office is responsible for maintaining appeals records, determining whether students have just cause, and ensuring that complete documentation is available for all committee members. The committee communicates its decision to the student, the relevant unit, and the provost.

Office of the Ombudsman
The Office of the Ombudsman is a neutral, independent, informal, and confidential resource to facilitate fair, equitable, and expeditious resolution of university-related concerns and problems raised by students. The ombudsman is an advocate for fairness and the equitable treatment of students, operates independently of all formal grievance processes at the university, and considers all sides of an issue in an impartial and objective manner. The ombudsman has no authority to make exceptions or to grant requests, but can perform informal investigations and, as a result, may recommend actions that lead to changes in processes and policies at the university. Meetings with the ombudsman are confidential. The ombudsman serves graduate and undergraduate students at the university.

Privacy of Student Records

Office of the University Registrar
Web: registrar.gmu.edu/privacy.html

Each year, Mason informs students of the Family Educational Rights and Privacy Act (FERPA) of 1974. The university intends to comply fully with this act, which protects the privacy of education records, establishes the right of students to inspect and review their education records, and provides guidelines for amending inaccurate or misleading data through informal and formal hearings. Students also have the right to file complaints with the Family Policy Compliance Office (U.S. Department of Education) concerning alleged failures by Mason to comply with the act.

The Notification of Rights under FERPA and the Public Notice Designating Directory Information detail students’ rights and the procedures implemented by the university to comply with FERPA.

FERPA is a federal law that affords students certain rights with respect to their education records. Specifically, it affords students the right to: (1) inspect and review their education record; (2) request the amendment of inaccurate or misleading records; (3) consent to disclosure of personally identifiable information contained in their education record; and (4) file a complaint with the Family Policy Compliance Office of the U.S. Department of Education concerning alleged failures of the university to comply with the act. George Mason University strives to fully comply with this law by protecting the privacy of student records and judiciously evaluating requests for release of information from those records. FERPA authorizes the release of “directory information” without the student’s prior consent under certain conditions, which are set forth in the act. George Mason University has defined its “directory information” in accordance with the law. Please visit the Office of the University Registrar website at registrar.gmu.edu for additional information about student privacy and FERPA.

Public Notice Designating Directory Information

George Mason University designates the following as public or “directory information.” Such information may be disclosed by the university without the student’s prior consent under the conditions set forth in the Family Educational Rights and Privacy Act of 1974 (FERPA).

Directory Information: Student name, address, telephone numbers(s), e-mail address, date and place of birth, major, dates of attendance, enrollment status (full time, part time), class, previous institutions, major field of study, awards, honors (including Dean’s List), degrees conferred including dates, past and present participation in officially recognized sports and activities, and physical factors (height and weight of athletes).

Note: Directory information is information that Mason may disclose, but it is not required to do so. It is Mason’s policy to refrain from actively disclosing addresses, telephone numbers, and dates of birth; however, the university routinely verifies this information. Mason does not disclose social security numbers, personal identification numbers, photographs, grades, grade point
averages, class schedules, academic actions nor the number of credits enrolled in or earned unless the student has signed a consent form.

Currently enrolled students may withhold disclosure of directory information under FERPA. To withhold disclosure, students must present a photo ID in person at the Office of the University Registrar, Fairfax or Prince William campuses, and complete the Request to Prevent Disclosure of Directory Information Form. The form may be submitted at any time throughout the year and will immediately affect prospective disclosures. George Mason University assumes that failure on the part of any student to specifically request the withholding of a category of directory information indicates individual approval for disclosure. Former students may not place a new request for nondisclosure of directory information on their education records; however, they may request its removal.

Confidential (Private) Hold: Prevents the disclosure of all directory information including name, address, telephone number(s), e-mail address, date and place of birth, photographs, major, dates of attendance, enrollment status (full time, part time), class, previous institutions, major field of study, awards, honors (including Dean’s List), degrees conferred (including dates), past and present participation in officially recognized sports and activities, and physical factors (height and weight of athletes).

Note: Confidential status does not convey a right to be anonymous in the classroom or to impede routine classroom communication and interactions. Students with confidential status should expect to be identified in class by name and to have their Mason email address used for class purposes.

Students who elect this category must conduct all university business either in person with a photo ID card or from a remote location with an original notarized request. Such students’ names will be published in the commencement program unless the students request exclusion in writing. Students in this category are eligible to use interactive web and other electronic systems, such as Patriot Web, for transactions (including registration) which are protected by a secured login.

Academic Assessment

All academic programs at Mason (including the University General Education program) have student learning outcomes that are assessed periodically. Student work in various courses may be used for such an assessment. Student anonymity is assured and grades will not be affected. At any time, students may contact the Office of Institutional Assessment at assessment@gmu.edu with questions, concerns, and comments about the use of academic work in assessment activities.

Students may be called on from time to time to participate in focus groups, complete questionnaires, or contribute in some other way to the ongoing assessment process. At any time, students may contact the Office of Institutional Assessment with concerns, comments, and recommendations about their educational experiences at Mason. Assessment is vital to the continuous improvement of the university, and student input forms an important part of the process.

To find out more about the learning outcomes and assessment activities of a specific program, whether curricular or extracurricular, go to assessment.gmu.edu.

Student Identification Card

After registering, each student should obtain a university photo identification card. It must be presented to use library services and is required for admission to university events and when using facilities after normal operating hours. It is not transferable and is valid as long as the student has active status. For more information, call the Mason Card Office at 703-993-1004, or go to the Mason Card Office website.

Change of Status, Address

Each student is required to provide Mason with current contact and identifying information, including permanent and local addresses, telephone numbers, and legal name. Each student must also maintain the university e-mail account assigned at the time
of admission. Students are responsible for official communications directed to Mason e-mail accounts. For more information, go to masonlive.gmu.edu.

Addresses should be updated over the Internet using Patriot Web. Name and Social Security number changes require official documentation and must be processed in person at the Office of the University Registrar or with the original copy of a notarized request.

**Honor System and Code**

Web: academicintegrity.gmu.edu

Mason shares in the tradition of an honor system that has existed in Virginia since 1842. The code is an integral part of university life. On the application for admission, students sign a statement agreeing to conform to and uphold the Honor Code. Students are responsible, therefore, for understanding the code’s provisions. In the spirit of the code, a student’s word is a declaration of good faith acceptable as truth in all academic matters. Cheating and attempted cheating, plagiarism, lying, and stealing of academic work and related materials constitute Honor Code violations. To maintain an academic community according to these standards, students and faculty members must report all alleged violations to the Honor Committee. Any student who has knowledge of, but does not report, a violation may be accused of lying under the Honor Code.

The Honor Committee is independent of the student government and the university administration. It is composed of students selected by the student body, and it has the primary duty of espousing the values of the Honor Code. Its secondary function is to sit as a hearing committee on all alleged violations of the code.

At the beginning of each semester, faculty members have the responsibility of explaining to their classes their policy regarding the Honor Code. They must also explain the extent to which aid, if any, is permitted on academic work.

The complete Honor Code is as follows:

*To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code: Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.*

**Honor Committee**

The Honor Committee is a group of Mason students selected to promote academic integrity as a core value for our university community. Members of the committee also serve on hearing panels established to investigate and resolve alleged violations of the code. Mason's School of Law has an Honor Committee that is independent from the rest of the university's Honor Committee.

Membership will be limited to 100 members who apply for membership and are confirmed at an election held each spring. Members appointed by the chair of the Honor Committee may serve provisionally pending the next election. Undergraduate members must have no Honor Code violations, maintain a cumulative GPA of 2.66, be in good academic standing, and successfully complete the training and orientation program. Graduate members must meet all of the requirements above with the exception of maintaining a cumulative GPA of 3.00. If more than 100 students apply for membership, a candidate list will be maintained according to the date of the application, and appointments will be made as vacancies occur. The term of office extends from initial appointment until final graduation, provided the member is not found responsible for an Honor Code violation, serves on at least two hearing panels each semester, remains in good academic standing, and maintains the required GPA.

A chair and vice chair will be elected in April of each year by the members of the committee. The term of office will be one year. A faculty advisor, chosen jointly by the chair of the committee and the vice president for university life, will provide administrative assistance for committee business.
**Student Responsibilities**

Students should request an explanation of any aspect of the professor’s policies regarding the Honor Code that they do not fully understand. They also have an obligation not only to follow the code themselves, but also to encourage respect among their fellow students for the provisions of the code. This includes an obligation to report violations by other students to the Honor Committee.

**Faculty Responsibilities**

Faculty members are responsible for maintaining the integrity of the learning and testing process. They should explain at the beginning of each semester what would be considered a violation of academic integrity in their courses. Special attention should be given to the subject of plagiarism. Faculty members may actively proctor exams in situations they believe warrant such action.

**Procedures for Reporting Violations**

Suspected violations should be reported to the Honor Committee in a timely manner using forms provided by the Honor Committee. The Honor Committee will promptly notify the involved students in writing. Those students will meet with a representative of the Honor Committee to review the information and arrange for resolution of the matter.

**Hearing Panels**

When a student disputes an allegation, a five-member panel of Honor Committee members, appointed by the chair of the Honor Committee, will meet with both the student and the person(s) reporting the alleged offense. Each side will present information, and the panel will determine whether clear and convincing evidence of a violation has been presented. At least four of the five panel members must judge that the evidence proves responsibility for the offense. If the student is found responsible, a sanction or sanctions will be determined by majority vote of the panel.

**Counsel**

The hearing panel will have a faculty member present during the hearing to offer assistance when requested by the chair of the panel. All other parties may have an advisor present if that advisor is a member of the George Mason University student body, other than a student from the School of Law.

**Sanctions**

The hearing panel may impose oral and written reprimands and other such nonacademic sanctions as it deems proportionate to the offense. It can recommend sanctions to the course professor that involve reduced grades. Recommendations for nonacademic suspension and nonacademic dismissal are forwarded to the provost’s delegate. In determining sanctions, panel members should keep in mind the nonpunitive educational purpose of the Honor Code process.

**Appeals**

Appeals of honor committee decisions must be submitted in writing within seven business days of the hearing. Appeals can be granted only on the basis of new evidence, procedural irregularity, or other grounds of sufficient gravity to call into serious doubt the original hearing panel’s decision. The decision to accept or deny the appeal will be made by three Honor Committee members who have had no prior contact with the case. In the event that a faculty member does not elect to follow the Honor Committee’s recommended sanction, students may appeal the faculty member’s action to the Academic Appeals Committee, via the Provost’s Office. The decision of this committee is final.
Amendments

The Honor Committee, by majority vote, may approve proposed amendments to the Honor Code. The proposed amendments will be submitted to the student population at the next spring election, and they must be approved for implementation by a two-thirds majority of those voting.

Human Subjects Research
Please see the Research Section.

Animal Use in Research
Please see the Research Section.

Student Work, Intellectual Property
Generally, copyrightable and patentable works, including dissertations developed in connection with course work by students who are not Mason employees, are deemed to belong to the student. By policy, however, Mason does hold title to copyrightable software that implements a Mason patent. Mason may also claim copyright ownership of a work or ownership of a patentable invention when extraordinary use of university facilities, personnel, or resources is made in the development of the materials or invention, especially when unrelated to course work. Ownership and disposition of intellectual property developed by students while employed by the university, including undergraduates and graduate research and teaching assistants, is governed by university policies generally applicable to employees. Students with questions are encouraged to contact the Office of Technology Transfer, ott@gmu.edu or 703-993-8933.

Conduct within the University Community
Students enrolling in the university assume an obligation to conduct themselves in a manner compatible with the university’s function as an educational institution. The Code of Virginia (Section 23-9.2:3) confers on the university the responsibility for maintaining order within the university and the right to exclude those who are disruptive.

The Office of Student Conduct holds administrative responsibility for supervising student conduct of Mason students and their guests. Questions regarding student conduct should be directed to the Office of Student Conduct, SUB I, Room 4100, 703-993-6209, studentconduct.gmu.edu.

Student Health Services
Student Health Services provides high-quality health care to all currently enrolled students. There is no charge to be seen by one of our health care providers. There are minimal fees for lab work, medication and procedures. The staff includes physicians, nurse practitioners, registered nurses, medical assistants, and various levels of support personnel. Appointments are required for nonemergency services.

For more information, please visit shs.gmu.edu.

Student Health offices are located on the Fairfax, Prince William, and Arlington campuses. Contact information is as follows:

**Fairfax Campus**: SUB I, Suite 2300, 703-993-2831

**Prince William Campus**: Occoquan Building, Suite 229, 703-993-8374

**Arlington Campus**: Founders Hall, Suite B102, 703-993-4863

Immunization Requirements
Immunization policies are determined by legislation enacted by the Virginia General Assembly and recommendations from the Advisory Committee on Immunization Practice, the Centers for Disease Control and Prevention (CDC), and the American College Health Association (ACHA). All students born after December 31, 1956, are required to provide documented evidence that they have been immunized against certain communicable diseases.

The required immunizations are as follows:

- Two doses each of measles, mumps, rubella, after 1967 or the combination MMR, (after 1971), or a laboratory report of a titer documenting positive immunity, to each of the diseases.
- Primary tetanus, diphtheria, and pertussis series, with last tetanus and diphtheria booster within the past 10 years. Students requiring a decennial booster should receive Tdap.
- Students, ages 16-21, living in the residence hall are required to be vaccinated against meningococcal disease. Students not living in residence halls may choose to be vaccinated to reduce their risk of meningococcal disease. Students may sign a waiver stating that they have received and reviewed information on meningococcal disease and the availability and effectiveness of the vaccine but have chosen not to be vaccinated. If the student is younger than 18 years old, the waiver must also be signed by a parent or other legal representative.
- Students shall be immunized against hepatitis B disease, or they must sign a waiver stating that they have received and reviewed information on hepatitis B disease and the availability and effectiveness of the vaccine but have chosen not to be vaccinated. If the student is younger than 18 years old, the waiver must also be signed by a parent or other legal representative.
- Tuberculosis (TB) screening is required for all students as defined by the CDC and ACHA. TB screening must have been completed in the United States, within the past 6 months. For more information, please visit shs.gmu.edu/immunizations.

Completed Immunization Records must be submitted to the Immunization Office by October 1st for the Fall semester or March 1st for the Spring semester. Incomplete or late immunization records will be assessed a LATE FEE and a hold will be placed on your Patriot Web Account. Records can be sent to George Mason University, SUB I, Suite 2349, 4400 University Drive, MS 2D3, Fairfax, Virginia 22030. Immunization records can also be faxed to 703-993-4053. The immunization record is included as a tear-out form in the orientation booklets that are mailed to all new undergraduate and transfer students when their application for admission to the university has been approved. If you would like to receive vaccinations at Student Health Services, please call 703-993-2135 to schedule your immunization appointment. For vaccine prices and more information visit shs.gmu.edu/immunizations or call 703-993-2135. E-mail questions to immunize@gmu.edu. Immunization records will not be accepted by email.

Drug and Alcohol Policy

The abuse of drugs and alcohol by members of the campus community is not compatible with the goals of the university. Mason attempts to prepare individuals to act responsibly by defining standards of behavior and providing educational programs to create an awareness of drug- and alcohol-related problems. Those in need of assistance in dealing with drug and alcohol-related problems are encouraged to seek the confidential help of the university’s Office of Alcohol, Drug, and Health Education, adhe.gmu.edu.

Drugs

- Use and/or possession of illegal drugs or drug paraphernalia are prohibited on the campuses of George Mason University. Use and/or possession and distribution of prescription drugs without proper medical documentation is within the scope of this policy. Violation of this community standard will be considered a serious offense. Implementation of this policy will be in accord with established university procedures as contained in the Code of Student Conduct.
- The University Police will enforce all applicable local, state, and federal laws in accordance with established standing orders, procedures, and guidelines.
- There will be a university review of all reports of drug offenses involving George Mason University students. Action under the Code of Student Conduct will neither prejudice nor be prejudiced by action taken in the criminal justice system.
Any student found responsible for a violation of law or regulation involving illegal drugs may, at the discretion of the hearing officer, be required to undergo an evaluation administered by personnel of the University’s Office of Alcohol, Drug & Health Education prior to re-admittance to the University.

The housing status of a resident student found in violation of a campus drug regulation will be determined by the hearing officer. Guests and visitors found responsible of violating a campus drug regulation while in a residence hall will likely be issued a trespass order prohibiting their presence in any and all residential buildings of the George Mason University campuses. This trespass order will be in effect for a minimum of one calendar year.

In addition to a one year eviction and trespass from campus residence halls, the standard sanction for a student’s first violation involving possession or use of marijuana or possession of drug paraphernalia is likely to be suspension from the University for a minimum of one academic semester.

Any student found responsible for a violation involving sale or possession of an illegal substance, including prescription drugs, with intent to distribute is likely to be permanently separated from the University.

Any student found responsible for use or possession of an illegal drug other than marijuana, including prescription drugs, is likely to be suspended from the University for a minimum of one year. The suspended student may be asked to provide evidence of successful completion of a drug treatment program prior to reinstatement.

Alcohol

The possession and consumption of alcoholic beverages is limited to those locations and circumstances authorized by university policy.

Alcohol possession or consumption is prohibited in any residence hall room or suite where all residents assigned to the space are under the age of 21. Students over the age of 21 may possess alcoholic beverages in accordance with established university policy.

No alcoholic beverages may be consumed in public areas of residence halls. This includes, but is not limited to, hallways, study rooms, and lounges.

All first time offenses of this policy by residential students, except those involving severe intoxication and/or emergency medical response, will normally be adjudicated a hearing officer within the Office of Housing & Residence Life. All offenses by non-resident students will normally be referred to the Office of Student Conduct.

Sanctions assigned by hearing officers from the Office of Housing & Residence Life will be primarily educational, but may include a housing assignment change, referral to the Office of Student Conduct, eviction from housing, or suspension from the university.

Sanctions imposed by the Office of Student Conduct will be designed to offer assistance in overcoming an identified problem. While the purpose of sanction will be educational and remedial, it may be appropriate to remove the student from the residence halls or from the University.

The University will encourage parental involvement whenever there is a repeat offense or when the first offense indicates a serious problem. This involvement will be in accord with the provisions of the Family Education Rights & Privacy Act.
General Policies

- Conduct within the University Community
- Equal Opportunity and Nondiscrimination Policy
- Drug and Alcohol Policy
- Responsible Use of Computing Policy
- Parking Policy
- Other Policies
- Other Regulations

Conduct within the University Community
For policies on conduct within the University community please see Student Rights and Responsibilities.

Equal Opportunity and Nondiscrimination Policy
George Mason University is committed to providing equal opportunity and an educational and work environment free from any discrimination on the basis of race, color, religion, national origin, sex, disability, veteran status, sexual orientation, age, pregnancy or marital status. Mason shall adhere to all applicable state and federal equal opportunity/affirmative action statutes and regulations.

The university is dedicated to ensuring access, fairness, and equity for minorities, women, individuals with disabilities, and veterans (as covered by law) in its educational programs, related activities, and employment. Mason shall thus maintain a continuing equal opportunity program to identify and eliminate discriminatory practices in every phase of university operations.

Retaliation against an individual who has raised claims of illegal discrimination or cooperated with an investigation of such claims is prohibited.

Students and employees should bring questions or concerns to the attention of the Office of Equity and Diversity Services, Mason Hall, Suite D201, 703-993-8730. The Equal Opportunity/Affirmative Action Grievance Procedure lists the various ways to file a complaint. Grievance procedures can be found at equity.gmu.edu/ea_aa_grievance_procedure.html.

Sexual Harassment Policy

It is the policy of the university to provide an academic and work environment free from sexual harassment. Sexual harassment is contrary to the standards and mission of the university. Sexual harassment is illegal and will not be tolerated. Each member of the university community has a responsibility to maintain an academic and work environment free from sexual harassment. The university will take whatever action is necessary to prevent, stop, correct, or discipline harassing behavior. Same-sex sexual harassment violates this policy and is subject to discipline under the same procedures. Sexual harassment does not include verbal expression or written material that is relevant to course subject matter or curriculum, and this policy shall not abridge academic freedom or the university’s educational mission.

Sexual harassment is defined by law as unwelcome sexual advances, requests for sexual favors, and other verbal, physical, or other form of expressive communication of a sexual nature when submission to or rejection of such conduct is used as a basis for employment or academic decisions, or such conduct has the purpose or effect of unreasonably interfering with an individual’s work or academic performance, is considered severe and pervasive or creating an intimidating, hostile, or sexually offensive work or academic environment. Examples of behavior that may be considered sexual harassment include, but are not limited to, the following:

- Sexual assault
• Explicitly or implicitly requiring submission to sexual advances as a condition or term of education or employment, i.e., grades, employment, promotion, letters of recommendation, or other privileges
• Repetitive sexual comments, questions, jokes, gestures, or other forms of sexually explicit expression

Any student, faculty member, or staff employee who believes he or she is the victim of sexual harassment should report the incident promptly in the manner most comfortable to him or her. The Equal Opportunity/Affirmative Action Grievance Procedure lists the various ways to file a complaint. Grievance procedures can be found at equity.gmu.edu/eo_aa_grievance_procedure.html.

Retaliation against an individual who has raised claims of illegal discrimination or cooperated with an investigation of such claims is prohibited.

Any employee who becomes aware of sexual harassment or other potentially discriminatory behavior must contact the Office of Equity and Diversity Services.

The Office for Equity and Diversity Services is responsible for administering and monitoring Mason’s equal opportunity/affirmative action policies and procedures. Inquiries about or complaints alleging violation of the university’s equal opportunity/affirmative action policies should be directed to the Office of Equity and Diversity Services, Mason Hall, Suite D201, 4400 University Drive, MS 2C2, Fairfax, Virginia 22030. Phone: 703-993-8730; TTY: 703-993-8787.

Nondiscrimination and Reasonable Accommodations on the Basis of Disability

The university is committed to providing equal access to employment and educational opportunities for people with disabilities. Mason recognizes that individuals with disabilities may need reasonable accommodations to have equally effective opportunities to participate in or benefit from the university educational programs, services, and activities, and have equal employment opportunities. The university will adhere to all applicable federal and state laws, regulations, and guidelines with respect to providing reasonable accommodations as necessary to afford equal employment opportunity and equal access to programs for qualified people with disabilities. Applicants for admission and students requesting reasonable accommodations for a disability should call the Office of Disability Services at 703-993-2474. Employees and applicants for employment should call the Office of Equity and Diversity Services at 703-993-8730. Questions regarding reasonable accommodations and discrimination on the basis of disability should be directed to the Americans with Disabilities Act (ADA) coordinator in the Office of Equity and Diversity Services.

Drug and Alcohol Policy

The abuse of drugs and alcohol by members of the campus community is not compatible with the goals of the university. Mason attempts to prepare individuals to act responsibly by defining standards of behavior and providing educational programs to create an awareness of drug- and alcohol-related problems. Those in need of assistance addressing drug and alcohol related problems are encouraged to seek the confidential help of the university's Office of Alcohol, Drug, and Health Education, adhe.gmu.edu.

Notice to All State Employees

The federal Drug-Free Workplace Act requires the university to inform all employees of the state that the unlawful manufacture, distribution, possession, or use of a controlled substance is prohibited in the workplace. The workplace consists of any state-owned, controlled, or leased property, or the site where state work is performed. Any employee who violates this prohibition will be subject to disciplinary action up to and including discharge and, at the discretion of management, will be required to satisfactorily participate in a drug abuse assistance or rehabilitation program. Employees must abide by the terms of this prohibition as a condition of employment and must notify their supervisor no later than five days after conviction of any criminal drug statute conviction occurring in the workplace.

Commonwealth Policies on Alcohol, Drug Use
Those who purchase, possess, and consume alcoholic beverages on campus must do so responsibly and must have reached the legal age of 21. All members of the university community (students, faculty, staff, and alumni, and their guests) are expected to comply with university-related regulations, as well as federal and state laws regarding the use of alcohol. Compliance also extends to university-sponsored activities held off campus. Students and employees are expected to take personal responsibility for their own conduct when making decisions regarding alcohol use.

Virginia law prohibits the purchase, possession, or consumption of beer, 3.2 beverages, wine, or distilled spirits by those under the age of 21. The law also prohibits purchasing for or serving such beverages to a person under age 21. Underage people who use or attempt to use a driver’s license that has been altered, forged, borrowed, or is in any way deceptive in an attempt to obtain prohibited beverages shall have their driver’s license revoked for a minimum of 30 days but for not more than one year. Consuming alcohol in unlicensed, public places or offering a drink to another in a unlicensed, public place is also a violation of Virginia law. The sale of alcoholic beverages to an intoxicated person is prohibited. In addition, it is unlawful for an intoxicated person to purchase or possess alcoholic beverages. While purchase or possession by an intoxicated person is a misdemeanor, violators are subject to having their driver’s license revoked for one year.

It is illegal to operate a motor vehicle, including mopeds, when a person has a blood alcohol concentration (BAC) of 0.08 percent or higher. Individuals under age 21 who drive with a BAC of more than 0.02 percent but less than 0.08 percent risk having their driver’s license suspended for six months and being fined up to $500. If a person is arrested for driving with a license revoked or suspended under a prior driving-under-the-influence (DUI) conviction, the offender’s car is immediately impounded for 30 days. Following conviction, the court can impound the vehicle for an additional 90 days. If the car does not belong to the offender, the owner of the car may petition the court for release of the vehicle.

Sobriety spot checks to detect drunken drivers are legal. Refusing a breath test or having a BAC of 0.08 percent or higher may result in an individual’s driver license being revoked for seven days. The option to request a blood test instead of a breath test for an alcohol-related offense is no longer available.

It is illegal to serve alcohol from an unregistered keg, which is defined as a common container holding four gallons or more. Only University Dining Services or other authorized entity may serve alcohol from kegs.

Possession, use, sale, or distribution of controlled substances, including marijuana, is a violation of federal and state laws, as well as university regulations. The 1988 federal Drug-Free Workplace Act also prohibits the unlawful manufacture, distribution, possession, or use of a controlled substance in the workplace.

Students, faculty, staff, and sponsoring organizations found in violation of state or university regulations may be subject to disciplinary action, civil action, or loss of the privilege to reserve or use university facilities. Disciplinary action for students or student organizations will be conducted in accordance with University Judicial System for Student Conduct, and civil proceedings may occur in certain situations. Resulting sanctions are intended not to punish individuals but to provide education and rehabilitation services.

Sanctions depend on the severity of the violation and can range from written warning to expulsion from the university. Most sanctions for violations of alcohol and drug policies will require the student to undergo an evaluation by a licensed clinician, who will assess the severity of substance use and/or abuse and offer referrals to appropriately assist the student. Employees found in violation of the university’s drug and alcohol policy may be subject to action by the appropriate administrative office.

Health Risks

Alcohol is a depressant that slows brain activity. Alcohol use can impair decision-making abilities and lead to negative consequences, including risky sexual behavior. Drinking alcohol should be avoided by pregnant women and anyone taking prescription medications or operating a motor vehicle. Long-term or heavy use of alcohol is linked to cancer, heart and liver damage, and other serious illnesses, and can lead to tolerance and physical and psychological dependence. Excessive alcohol intake can cause death from alcohol poisoning. All students and employees are expected to respect those who choose not to drink.

Illicit drugs have more than legal consequences; they have specific health and ethical risks that can cause dangerous consequences and unhealthy, dependent behavior. Use of alcohol (or any other drug) in a manner that leads to impairment or
intoxication is unhealthy and risky, and should be avoided and discouraged. The potential for health problems can also develop from the use of nicotine or caffeine products.

Those who need assistance in dealing with alcohol and other drug problems are encouraged to seek the confidential services of the resources listed in the Campus and Community Resources section listed below.

**General Rules for Serving Alcoholic Beverages**

University regulations prohibit the possession or consumption of any alcoholic beverage on university grounds unless the university has sanctioned the location and conditions for possession or consumption. For more information, please review the comprehensive guidelines for alcohol service available in The Office of Alcohol, Drug and Health Education (OADHE).

**Campus and Community Resources**

**Fairfax Campus—Office of Alcohol, Drug and Health Education:** SUB I, Suite 3200, 703-993-3687

**University Police:** 703-993-2810 or for emergencies dial 9-1-1

**State Employee Assistance Service:** 804-786-6741

**Alcoholics Anonymous:** 703-993-3686 for campus meetings; for other locations, 703-876-6166

**Narcotics Anonymous:** 703-532-1255

The drug and alcohol policy outlines university regulations on substance use and abuse. This policy is distributed annually to all employees and students to inform the campus community of alcohol and drug laws, health risks, and campus and community resources. University regulations regarding the drug and alcohol policy have been developed by a committee of faculty, staff, and students. This policy statement is available in the Office of Alcohol, Drug and Health Education, SUB I, Suite 3200 and is accessible online through the Office of Student Conduct. This policy is also distributed through the student and faculty and staff handbooks and the university student newspaper, *Broadside*.

**Responsible Use of Computing Policy**

The Responsible Use of Computing (RUC) Policy applies to all academic and operational departments and offices at all university locations owned or leased. The policies and procedures provided herein apply to all Mason faculty, staff, students, visitors, and contractors.

The university provides and maintains general computing services, including web and Internet resources, and telecommunication technology to support the education, research, and work of its faculty, staff, and students. At the same time, Mason wishes to protect all users’ rights to an open exchange of ideas and information. This policy sets forth the responsibilities of each member of the Mason community in preserving the security, confidentiality, availability, and integrity of Mason computing resources. To accomplish these ends, this policy supports investigations of complaints involving Mason computing abuse, including sexual harassment, honor code, federal, state, applicable industry, and local law violations.

University faculty and staff members, as state employees, are subject to the Freedom of Information Act, §2.2-3700, et seq., of the Code of Virginia, and all applicable state and federal rules and regulations. While this policy endeavors to maintain user confidentiality, it cannot create, nor should faculty or staff members presume, any expectation of privacy.

Violations of this policy may result in revocation of access, suspension of accounts, disciplinary action, or prosecution. Evidence of illegal activity will be turned over to the appropriate authorities. It is the responsibility of all users of Mason computing resources to read and follow this policy and all applicable laws and procedures (user sign-on agreement).

To report violations of this policy, or any related university policy, e-mail the Security Review Panel (SRP) at StopIt@gmu.edu or abuse@gmu.edu.
Definitions

Mason computing resources. All computers, systems, workstations, networks, networking equipment, peripheral devices, servers, and any other university property attached to Mason’s web site or Internet network. These resources include all software, files, documents, and databases stored in Mason computing systems. The Mason web site includes all web pages that reside on servers owned by Mason. The Mason web site does not include servers or other resources owned by Internet service providers or personal resources owned by members of the Mason community who may use the resources to access Mason computing resources.

System administrator (SA). Anyone who has the responsibility to maintain, configure, operate, or repair Mason’s computing resources. System administrators have special privileges and special responsibilities under this policy.

Information Technology Unit (ITU). The organizational entity that is responsible for information technology (IT) equipment and services within the Mason campus system. The ITU is headed by the vice president for Information Technology (VPIT), who is administratively responsible for this policy.

Technology Council. A group of Mason faculty and staff members that provides advice and recommendations to the VPIT regarding the selection and architecture of technologies used to provide IT services.

Responsibilities of the Various Groups

System administrator. The SAs have extraordinary powers to override or alter access controls, configurations, and passwords. This power should be exercised with great care and integrity. SAs’ actions are constrained by this policy and by the policies of local administrative units.

Data stewards of Mason units who employ SAs are responsible for ensuring that the SAs comply with and enforce the requirements of this policy in the systems for which they are responsible. SAs who violate this policy or who misuse their powers are subject to disciplinary action.

If an SA observes someone engaging in activities that would seriously compromise the confidentiality, availability, or integrity of a Mason system, network, or electronic Mason data, the SA may take immediate action to stop the threat or minimize the damage or contact the ITU Support Center to activate the Computer Security Incident Response Team. SAs who observe suspected violations of law should immediately alert the University Police.

Security Review Panel (SRP). This policy establishes an SRP that is responsible for reviewing SAs’ decisions, responding to complaints, providing security advice, and periodically reviewing this policy. The SRP consists of the director of IT security, three faculty members, two members of Mason’s Technology Council, one representative from the Faculty Senate, one graduate student, one undergraduate student, one ITU staff member, and one non-ITU system administrator. The VPIT appoints the SRP members. The SRP chair will be one of the faculty members and will be appointed by the VPIT.

The SRP is responsible for periodically reviewing the RUC Policy and recommending improvements and clarifications as needed. All modifications to the policy will be made after full public disclosure and a reasonable period for public comment.

The SRP will establish a dispatching procedure for routing StopIt complaints to the appropriate official or staff member for action.

Rules of Use

Access to Mason’s computing resources is a privilege granted on a presumption that every member of the Mason community will exercise that privilege responsibly. Because it is impossible to anticipate all the ways in which individuals can damage, interrupt, or misuse Mason’s computing resources, this policy focuses on a few simple rules. These rules describe actions that users should avoid and the principles behind them. Each rule is followed by a nonexhaustive list of examples of actions that would violate the rule.
Rule 1. Use Mason computing resources consistently with the following intended purposes:

- Educational, research, and administrative purposes of Mason
- Uses indirectly related to Mason purposes that have an educational or research benefit, such as news reading, web browsing, chat sessions, and personal communications
- Employees and contractors of the Commonwealth of Virginia may not use Mason’s computing resources for recreation or entertainment.

Rule 2. Do not use computer accounts for illegitimate purposes.

Account usernames identify individuals to the entire international Internet user community. Users may be held responsible for actions in the account. If that person violates any policies, his or her actions will be traced back to the username and the account holder may be held responsible.

Forbidden:

- Selling access to Mason’s computing resources
- Engaging in commercial activity not sanctioned by Mason
- Intentionally denying or interfering with any network resources
- Using or accessing any Mason computing resource, or reading or modifying files without proper authorization
- Using the technology to in any way misrepresent or impersonate someone else
- Sending chain letters
- Violating copyright laws and licenses
- Violating federal or state law, or university policy

Rule 3. Honor the privacy of other users.

Mason respects the desire for privacy and voluntarily chooses to refrain from inspecting users’ files, except as described below in Section V. SAs who carry out standard administrative practices, such as backing up files, cleaning up trash or temporary files, or searching for rogue programs, do not violate privacy. Some examples of privacy violations are

- Accessing the contents of files of another user without explicit authorization from that user
- Intercepting or monitoring any network communications meant for another person
- Transmitting or distributing personal or private information about individuals without explicit authorization from the individuals affected
- Creating or using programs (e.g., key-loggers) that secretly collect information about users. Note that most systems keep audit trails and usage logs; these are not secret and are considered normal parts of system administration.

Rule 4. Do not use any account except the one you have been authorized to use.

If a user has a legitimate reason to give someone else access, it should be strictly temporary. The account holder should change the password after another user finishes using the account.

Rule 5. Do not use Mason’s computing resources to violate other policies or laws.

The list below is not comprehensive. In case of doubt, ask the SRP or e-mail stopit@gmu.edu.

- Using Mason’s computing resources to violate harassment laws or policies. Various types of harassment, including sexual or racial, are proscribed by Mason policies.
- Using Mason’s computing resources to violate the Honor Code
- Extending the Mason network without explicit permission from ITU Network Engineering. The unauthorized use of routers, switches, modems, and other devices can affect the security and stability of the network.
- Running vulnerability scans on systems. This action is considered hostile. If required for academic reasons, written permission from the system owner is required.
- Using Mason’s computing resources to transmit, store, display, download, print, or intentionally receive obscene material or distribute pornographic material. All users of Mason computing resources are subject to all federal and state...
obscenity laws. State employees should also be aware of state laws prohibiting the use of state equipment to access, store, print, or download sexually explicit material.

Electronic Information Environment

Personal e-mail, electronic files maintained on Mason equipment, and personal web sites are part of a unique electronic information environment. This environment creates unique privacy issues that involve federal and state laws as well as Mason policies.

Mason reserves the right to inspect user files and communications for all lawful purposes, including investigating allegations of illegal activity, violations of Mason policies, or protection of the integrity and security of network systems.

Web pages. Mason will investigate all complaints involving personal web sites and will remove or block material or links to material that violate federal or state law or university policy.

Compliance

The StopIt Process. The process described here, called “StopIt,” uses a graduated approach to handle violations of this policy. This policy distinguishes between incidents that pose no immediate danger to persons or system integrity and incidents that do. The three-step StopIt process described below is for cases in which there are no immediate dangers.

Incidents posing immediate danger to persons or systems require immediate action. These include active system break-ins or intrusions, denials of service, and incidents or criminal activity conducted using Mason computing resources. In these cases, the responsible SA may take reasonable actions to deal with the threat, such as temporarily disconnecting the system from the network, temporarily suspending accounts, and calling law enforcement. The SA taking such actions will notify his or her supervisor, and the ITU Support Center as soon as practicable.

The StopIt process rests on two foundations:

- Wide distribution of policy information: Notices describing the essence of the RUC Policy will be displayed in academic computing labs on Mason premises; the same information will be provided to the community at least annually. By logging on to the Mason network, users are agreeing to the conditions of the RUC Policy (user sign-on agreement).
- Standard reporting mechanism: The StopIt e-mail address is monitored regularly by individual(s) appointed by the SRP. Harmful or disruptive behavior should be reported to the StopIt e-mail or the University Police. The individual who responds to a complaint will normally forward it to the SA of the system on which the infraction apparently occurred. That SA will investigate the complaint, determine its validity, and take appropriate actions (see below).

The steps of the process are as follows:

StopIt 1. First Warning

The SRP member handling a case (or SA, if the case is delegated) will send a warning letter or email to the alleged perpetrators of improper use of Mason computing resources, harassment, or other uncivil behavior. The letter will have this form:

“Someone using your account did [description of offense].” This is followed by an explanation of why this behavior violates which policy. “Account holders are responsible for the use of their accounts. If you were unaware that your account was being used in this way, it may have been compromised. Your system administrator can help you change your password and secure your account. If you are aware, then please make sure that this does not happen again.”

This warning ensures that the alleged perpetrators are aware that a policy violation may have occurred and that there was a complaint. It offers them an opportunity to desist without having to admit guilt and secure their account against unauthorized use.

StopIt 2. Second Warning
If there is a second offense from an account that received a first-warning letter, the SRP member will issue a second warning and may require that the account holder come to a mandatory interview. The SRP chair can authorize the temporary suspension of access to the user’s account if the individual fails to arrange for a mandatory interview. The user can request a hearing before the full SRP.

**StopIt 3. Disciplinary Procedures**

If the previous StopIt stages do not convince the perpetrators to desist, the matter will be turned over to the appropriate Mason authority designated for that type of offense. The SRP will make available all information and evidence it has on the case to that authority.

If it appears from the evidence that any federal or state laws may have been violated, the SRP may recommend suspension of the account pending the outcome of the Mason or law enforcement authorities’ investigation.

**Amendments**

All amendments to the Responsible Use of Computing Policy Number 1301 are to be reviewed and approved by the Office of the Provost and the Office of the Senior Vice President.

**Effective Date**

The policies herein are effective October 20, 1997, and were revised December 17, 2007. This policy shall be reviewed and revised, if necessary, annually to become effective at the beginning of Mason’s fiscal year, unless otherwise noted.

**Parking Policy**

Fairfax Campus Sandy Creek Parking Office  
Phone: 703-993-2710

Arlington Campus 219 Founders Hall  
Phone: 703-993-8146

Prince William Campus 112 Occoquan Building Office  
Phone: 703-993-4808

Web: parking.gmu.edu

All faculty, staff, and students who park on property owned or operated by the university must display a valid permit or park in a parking deck and pay an hourly or daily rate. On the Fairfax Campus, the decks are located on Mason Pond Drive and Sandy Creek Way off Patriot Circle and on Rappahannock River Lane off Patriot Circle. Visitors and guests must park in the deck or at a meter unless special arrangements have been made through Parking Services.

Permit enforcement runs 24 hours a day, seven days a week. Metered parking is designated for short-term use and is monitored from 5 a.m. to 2 a.m., seven days a week. Broken meters are considered closed parking spaces; any vehicles parked in such spaces are subject to citation.

Restricted areas such as yellow curbs, crosswalks, sidewalks, landscaped or barricaded areas, loading zones, disabled spaces, and fire and emergency lanes are monitored 24 hours a day, seven days a week.

To avoid receiving a substantial fine, students, faculty, and staff should purchase a permit as soon as they arrive on campus. Parking permits are available on annual or semester basis. Permits may be purchased online at parking.gmu.edu or at the Parking Services sales office, located in the Fairfax Campus Sandy Creek Parking Office. Hours are 8:30 a.m. to 7 p.m., Monday through Thursday and 8:30 a.m. to 5 p.m. on Friday. Current parking permit fees and citation fine amounts, as well as information pertaining to the Arlington and Prince William Campuses, are listed on the Parking Services web site.
Disabled parking is available at a number of convenient locations at Mason facilities. A Department of Motor Vehicles (DMV) disabled placard or license plate must be displayed along with a university permit; a DMV placard or license plate alone is not sufficient for parking in disabled spaces in university lots. A visitor with a DMV placard or license plate may park in a parking deck at prevailing rates. Parking in or blocking access to a disabled space carries a fine at the prevailing rate.

Some parking lots have designated spaces reserved for faculty and staff, resident students, special permit holders, or service and repair vehicles. Please read all signs posted at entrances to the parking lots. All vehicles must be parked in a marked space. Complete parking regulations can be found at the Parking Services web site. For more information, call the Parking Services Office at 703-993-2710 or e-mail parking@gmu.edu. Please check the Parking Services web site for special announcements and changes to the policy.

Motorist Assistance Program

Phone: 703-993-2715

The Motorist Assistance Program (MAP) is designed to assist drivers who have minor car problems. Trained MAP personnel are available to help with dead batteries and can contact lockout or towing services at the driver’s request and expense. MAP is available at the Fairfax Campus from 8 a.m. to 11 p.m., Monday through Sunday. To access this service, call 703-993-2715.

Mason Shuttles/CUE Bus/Transportation

Mason Shuttles: 703-993-2828
Transportation: 703-993-2828
Web: shuttle.gmu.edu, transportation.gmu.edu

The following shuttles are operated by the Mason Shuttle program free of charge to the user:

- Prince William shuttle, providing service between the Prince William and Fairfax Campuses, Monday through Friday
- Mason to Metro shuttle, providing service Monday through Friday and Saturday and Sunday evenings between the Fairfax Campus and the Vienna Metro Station
- The Campus Circulator shuttle, providing service around Patriot Circle Monday through Friday.
- The West Campus Express shuttle, providing service between the West Campus parking lot and President's Park, with stops at the Field House, Sandy Creek and Rappahannock River Lane. The West Campus Express operates 2 p.m. to 1 a.m. on Sundays and 7 a.m. to 1 a.m. Monday through Friday with no service on Saturdays.
- Gunston Go-Bus shuttle, providing service from the Fairfax campus to area shopping centers

For more information and current shuttle schedules, go to shuttle.gmu.edu, call 703-993-2828, or e-mail shuttle@gmu.edu.

Mason faculty, staff, and students may also ride the City of Fairfax CUE Bus for free by showing their Mason ID card. For schedule information, go to www.fairfaxva.gov/CUEBus/CUEBus.asp. For other transportation information, go to transportation.gmu.edu or e-mail transportation@gmu.edu.

Other Policies

Sexual Assault Policy

The following policy applies equally to all members of the Mason community: students, faculty, administrators, staff, contract employees, and visitors.

The university is committed to providing an institutional environment where all people may pursue their studies, careers, duties, and activities in an atmosphere free of threat of unwelcome and unwanted sexual actions. It strongly condemns sexual offenses, will not tolerate sexual offenders, and supports those who have been victimized.
Sexual assault includes the attempt or act of rape (sexual intercourse without consent or with a child under the age of 13, by a stranger, an acquaintance, or an intimate), forced sodomy (forced oral or anal sex), or the forced penetration by a foreign object either animate, such as a finger, or inanimate. Nonpenetration sexual assault includes the act of touching an unwilling person’s intimate parts such as genitalia, anus, groin, breast, or buttocks, or the clothing covering these parts, or forcing an unwilling person to touch another’s intimate parts.

The above acts constitute sexual assault when they are committed against a person’s will as evidenced by refusal of consent; through the use of force, threat, manipulation, or intimidation, or against a person who by virtue of mental incapacity or physical helplessness is unable to give or withhold consent. This includes, but is not limited to, incapacity or helplessness caused by alcohol or other drugs. Intoxication of the assailant shall not diminish the assailant’s responsibility for the sexual assault.

The university will respond promptly, fairly, and decisively to all reports of sexual assault. Members of the university community accused of sexual assault will be subject to university disciplinary procedures when the alleged incident has occurred on campus or the incident has occurred off campus and materially affects the learning environment or operations of the university.

Sexual assaults are serious violations of the university’s student judicial code, faculty standards, and university employee policies. They are crimes under state law and punishable by fines or imprisonment. In addition, these actions are subject to civil suit for damages.

Mason is compliant with the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act (the Clery Act) as amended in 1998, which requires all postsecondary institutions to publish and distribute certain information regarding campus crimes, including reports of campus sexual assault, sexual assault policies, and security programming to all current students, employees, and any applicant who so requests.

Through the Office of Sexual Assault Services, 24-hour assistance is available to those who have been affected by sexual assault.

For more information, contact Sexual Assault Services at 703-993-4364 and/or University Police at 703-993-2810; for emergencies dial 9-1-1.

**Stalking Policy**

Stalking is a crime under Virginia state law (18.2-60.3). Incidents of stalking outside Virginia may be admissible in court if they are relevant to the case and may be punishable as a misdemeanor or a felony. Stalking behavior is prohibited and will not be tolerated by Mason.

The university defines stalking as a series of behaviors that in context intend to place or have knowledge that the behaviors might place another person in reasonable fear of his or her safety or mental or physical well-being. Such behaviors include nonconsensual (unwanted) communication or contact, including face-to-face, telephone calls, voice messages, electronic mail, instant messaging, written letters, and unwanted gifts; harassment, either by the individual or through a third party; use of threatening gestures; pursuing or following; surveillance or other types of observation; use of electronic devices or software to track or obtain private information; trespassing; vandalism; and nonconsensual (unwanted) touching.

Some behaviors may result in separate criminal charges. While certain acts can be classified as crimes, others that do not rise to criminal behavior may still be subject to the campus judicial process. The university can take action and has the right to impose sanctions on an offender. Incidents occurring on or off campus are subject to university discipline when such actions materially affect the learning environment or operations of the university.

Legal options available to victims of stalking include reporting to the campus or local police, seeking a remedy through civil proceedings, and using the campus judicial process. Additional support is available from Sexual Assault Services.

This policy applies equally to all members of the Mason community: students, faculty, administrators, staff, contract employees, and visitors.
The university is committed to protecting the right of all individuals to pursue their intellectual, vocational, and personal interests without harassment or interference. The university is also committed to providing an environment in which visitors to and members of the campus community are treated with dignity, respect, and regard for their welfare and learning needs.

For more information on stalking issues or this policy, call Sexual Assault Services at 703-993-4364 and/or University Police at 703-993-2810; for emergencies dial 9-1-1.

**Statement of Information on Dating/Partner Violence**

*Effective March 2008*

**This statement of information applies to all George Mason University students, staff, and faculty.**

George Mason University is committed to providing an institutional environment where all persons may pursue their studies, careers, duties, and activities in an atmosphere free of threat of interpersonal violence. The university will support those who have been victimized by dating/partner violence by providing information and counseling services and, depending on the individual case, will refer the matter to the appropriate office or department to be handled under applicable university policies, regulations or Virginia criminal statutes.

**George Mason University Dating/Partner Violence Definition**

Dating/partner violence, as defined by George Mason University, is often a pattern of controlling behaviors but can be a one-time incident used by an individual to gain and maintain power and control over another individual in the context of a dating/partner or familial relationship. The pattern of controlling behaviors is not caused by a lack of impulse control on the part of the abuser or as a matter of coincidence but rather is usually an ongoing effort to maintain domination over the victim to ensure submission to the abuser's will. This definition applies to people in heterosexual and same-sex relationships.

**Other Definitions**

Controlling behaviors: May include, but are not limited to, physical and sexual violence, direct and implied threats of violence, emotional and psychological intimidation, coercion, verbal abuse, isolation, stalking, spiritual abuse, economic/financial control, ridiculing religious beliefs, invasion of privacy, actual or threatened use of weapons, threats of deportation, blackmail, destruction of property, and/or harm to the victim's family, pets, and significant others.

Dating/Partner: A short- or long-term relationship (current or former, including marriage) between persons intended to provide some emotional, romantic, or physical intimacy.

Familial Relationship (as defined in Virginia law, Section 16.1-228):

- The person's spouse, whether or not he or she resides in the same home with the person
- The person's former spouse, whether or not he or she resides in the same home with the person
- The person's parents, stepparents, children, brothers, sisters, half-brothers, half-sisters, grandparents and grandchildren, regardless of whether such persons reside in the same home with the person
- The person's mother-in-law, father-in-law, sons-in-law, daughters-in-law, brothers-in-law, and sisters-in-law who reside in the same home with the person
- Any individual who has a child in common with the person, whether or not the person and that individual have been married or have resided together at any time
- Any individual who cohabits or who, within the previous 12 months, cohabited with the person, and any children of either of them then residing in the same home with the person.

Family abuse: Any act involving violence, force, or threat including, but not limited to, any forceful detention that results in bodily injury or places one in reasonable apprehension of bodily injury and is committed by a person against such person's family or household member (as defined in Virginia law, Section 16.1-228).

**Support Available:**
George Mason University will make reasonable efforts to provide support and referrals to students involved with dating/partner violence. Because dating/partner violence often occurs in conjunction with sexual violence and stalking, Mason students experiencing dating/partner violence may seek confidential assistance from the university's Sexual Assault Services and Counseling and Psychological Services and the University Police.

**Reporting Incidents and Legal Options**

**Criminal:** Certain acts of dating/partner violence are crimes under Virginia law. These acts may be classified as assault and battery against a family or household member under Section 18.2-57.2 of the Virginia Criminal Code. Persons wishing to make an official police report and seek prosecution should contact the appropriate police agency.

**Civil:** Victims of dating/partner violence may seek to obtain a protective order at a local magistrate’s office and file a civil lawsuit to obtain compensation for personal damages. Victims can seek more information about protective orders and civil proceedings by contacting Mason's Sexual Assault Services.

**University discipline:** The university may take action and impose sanctions on those accused if the accused is an employee or a student, whether or not the incident rises to a criminal offense under Virginia law. Incidents occurring on or off campus between students and/or employees may be subject to university discipline when such actions materially affect the learning environment of the victim or the operations of the university. Sanctions on the accused may include education, counseling, restrictions, and penalties. See Behavioral Expectations 8 of the University Judicial Code.

For more information about the Office of Student Conduct and the University Judicial Code, please call 703-993-6209, go to studentconduct.gmu.edu, or visit SUB I, Suite 4100. Employees may contact George Mason University Employee Relations at 703-993-2600. To reach University Police, please call 703-993-2810 (Emergency - 9-1-1).

**Employee policies related to this issue:**

George Mason University Administrative Policy 2208—Preventing Workplace Violence

Virginia Department of Human Resource Management Policy 1.80—Workplace Violence

Virginia Department of Human Resource Management Policy 2.30—Workplace Harassment

Virginia Department of Human Resource Management Standards of Conduct Policy 1.60

*This statement of information was created by the George Mason University Sexual Assault Services Coordinating Council.*

**Other Regulations**

**Annual Security Report**

Mason’s 2011 Annual Security Report is available on the University Police web site. This report contains the previous three years' crime statistics and includes policies concerning campus security, such as sexual assault, stalking, and other matters that pertain to safety on campus. To view a copy of the report, go to www.gmu.edu/police/annualsecurity.htm. Paper copies of this report are available at any police facility.

**Weapons**

The unauthorized possession, storage, display, or use of any kind of ammunition, firearm, firework, explosive, air rifle, air pistol, or other lethal instrument is prohibited on university property. For more information, call University Police at 703-993-3840.
Smoking

Smoking is not permitted in any building on campus.

Bicycles and Skateboards

Bike racks are provided at various on-campus locations for the convenience of students who bike to and from campus. For resident students, bike racks are located in the residential complexes. Bikes and skateboards are not permitted on designated areas, stairs, ramps, footpaths, or grassy areas of the campus. They also are not allowed inside university buildings.

Pets

No pets, except those assisting people with disabilities, are permitted in university buildings at any time. Pets on campus grounds must be on a leash and under supervision at all times.

Solicitors and Salespeople

Except on official business with the university, solicitors and salespeople are not permitted on the campus without prior approval of the University Services Office.
Tuition, Expenses, and Financial Aid

- Tuition and Fees
  - Refund Policies
- Expenses
- Financial Aid

Tuition and Fees
4400 University Drive, MS 2E2
Fairfax, VA 22030
Phone: 703-993-2484
Fax: 703-993-2490

General Guidelines

- Students are responsible for maintaining a current mailing address in their student record on Patriot Web (patriotweb.gmu.edu), and for activating and checking their George Mason University e-mail accounts to receive official university communications.
- By registering for classes, students accept responsibility for the semester charges. Students are responsible for withdrawing from all classes that they do not intend to complete by the deadlines listed in the Academic Calendar. Full or partial tuition liability may apply. George Mason University does not cancel classes for nonpayment.
- Refer to the Payment Schedule and the Academic Calendar on the Student Accounts Office web site for payment due dates and tuition penalties for dropping classes after the start of the semester. Classes that do not meet for the full semester have non-standard liability deadlines, which can be found on the part-of-term chart of the Academic Calendar.
- Payments are due in the Cashier's Office, Student Union Building I, Room 1501, on or before 4:30 p.m. on due dates, regardless of postmark if mailed. Check and credit card payments made through the Bill and Payment System must be completed by 10:30 p.m. to be considered in that day’s business. Bills are mailed approximately thirty (30) days prior to the semester start. All subsequent bills are sent electronically. Bills are not mailed for individual class registration and schedule adjustments. Students must check Patriot Web for balance due, verify registration, and pay through the Bill and Payment System or at the Cashier's Office by the due date. Failure to receive a reminder bill confirming charges does not waive the requirement for payment when due.
- Students who have not completed the financial aid process must be prepared to pay for their courses by the tuition due date or a late payment fee will be charged. The amount of financial aid accepted and processed will be reflected in your account balance. If the amount of aid awarded is less than the charges, the difference must be paid by the tuition due date. Federal work-study awards cannot be deducted from your balance. Financial aid recipients must also notify their financial aid counselor if they drop courses below the minimum required credits for their financial aid award. Class registrations or schedule adjustments after financial aid has been disbursed may result in a balance due. Students are responsible for checking their balance after all schedule adjustments.
- The Family Educational Rights and Privacy Act of 1974 (FERPA) limits the release of student information to parents or other third parties without the student’s written consent. Students may set up authorized users in the Bill and Payment System to meet this requirement. Authorized users will receive electronic bill notifications and financial activity access only.
- Out-of-state students with pending domicile requests are responsible for payment at the out-of-state rate. Students who are later determined to be in-state can request reimbursement for the difference in tuition rates.
Non-returning students are responsible for withdrawing from their courses for the semester and ensuring they do not have an outstanding balance on their account. Any documentation or intent made to university departments that you are not returning does not withdraw you from the registered courses.

- Students enrolling in Mason off-campus courses are assessed tuition and fees at the same rates as those for on-campus courses.
- Some Mason degree programs include academic credits that students must earn at other academic institutions. Students enrolling for such credits assume all financial responsibility with the other institutions.

Semester Tuition Charges and Related Fees

Approved tuition rates and fees are available June 1. For more information, call the Student Accounts Office at 703-993-2484 or go to studentaccounts.gmu.edu. Students are charged tuition rates for registered courses according to their academic level and program; graduate rates vary by academic program.

New Student Fees: All new degree seeking students pay a New Student Fee. The fee is a mandatory, nonrefundable, one-time charge that is assessed when a new student registers for classes, regardless of orientation attendance or future enrollment status. The current fee amount is listed on the Student Accounts Office web site: studentaccounts.gmu.edu.

Educational Resource Fee: All students are charged a mandatory per-semester fee, $100 for more than six credits, and $60 for six or fewer credits, which allows Mason to maintain essential support services for both full and part-time students.

Please Note: Many courses require additional course fees and/or lab fees. Refer to the Student Accounts Office web site for up to date course fee information: studentaccounts.gmu.edu/tuition.

Payment Information

Payment Deadline

Payment is due the first day of the semester. Payments received at the Cashier's Office by 4:30 p.m. Monday to Friday will be considered in that day's business. Check and credit payments made on Patriot Web must be completed by 10:30 p.m. to be considered in that day's business. To confirm receipt of payment and balance due on account, go to patriotweb.gmu.edu.

Methods of Payment

Cash: At window only, Cashier's Office, SUB I, Room 1501

Check: Web, window, mail or drop box. Make check payable to George Mason University, with student ID number written on front. Third-party checks are not accepted. Checks must be payable in U.S. dollars. A $50 return check fee will be charged for checks returned unpaid by the bank for any reason.

Credit Card: Web only. MasterCard, American Express or Discover Card. There is a 2.75 percent convenience fee for credit card payments, which is nonrefundable.

Delivery Methods

Web: Bill and Payment system, on-line checks or credit cards

Window: Cashier's Office, SUB I, Room 1501, Monday through Friday 9 a.m. to 4:30 p.m.

Drop Box (no cash payments): Outside Cashier's Office, SUB I, Room 1501
U.S. Mail: George Mason University, Cashier's Office, 4400 University Drive, MS 2E1, Fairfax, VA 22030. Allow 10 business days for delivery by the due date, and postmarks are not considered a receipt of payment.

Semester Payment Plan

Mason payment plans are available on-line only, and the following plans are available for students who need to budget their accounts. All payment plans require a $25 contract fee, which is nonrefundable. Please note: The preferred payment method for payment plans is the on-line/electronic check option, which does not charge a convenience fee.

The Summer term offers a two payment plan only. The plan begins with a down payment of 50% and the $25 contract fee, and defers the second payment until mid-June.

In Fall and Spring there are two options available. One plan splits the balance into two payments of 50% each and the other splits the balance into four payments of 25% each. Both plans require a down payment, which is the first payment plus the $25 contract fee. Important deadlines must be followed to take advantage of the four payment plan. For more information, call the Student Accounts Office at 703-993-2484 or go to studentaccounts.gmu.edu.

Study Abroad/Global Education and International Student Health Insurance fee payments cannot be deferred. Failure to pay the deferred balance by the due date will result in a financial hold, a late fee of 10% (up to $125), collection activity, and may prevent future eligibility of the payment plan.

Third-Party Billing Authorizations

Students using a third-party billing authorization will be charged a $25 processing fee. Students may receive an individual billing statement. Students must provide the third-party authorization or government training voucher to the Student Accounts Office, or fax it to 703-993-2460 before the student’s individual due date, which is based on their registration date. Check “Important Dates” on the web site for the deadline to submit third party payment authorizations. Students are ultimately responsible for any defaults in payments by the sponsoring agency. Call 703-993-2484 for a copy of third-party billing requirements, or check the web at studentaccounts.gmu.edu/thirdparty.

Penalties

A late registration fee of $125 is automatically assessed to students who add their first class on the first day of the semester or after. It does not apply to students already enrolled prior to the start of the semester who make schedule adjustments. Wait-listed classes are not considered class registration. Late registration fees are nonrefundable and will not be removed, regardless of enrollment status.

Any class registration after the deadline to add classes, if approved by the academic department, is subject to a late registration fee of up to $125.

Past due balances are subject to a late payment fee that is 10 percent of the balance due, up to $125.

Registrations will not be canceled for nonpayment. Students must withdraw from all classes that they do not plan to complete by the payment due date to avoid the late payment fee on those classes.

Returned Checks

Per Commonwealth of Virginia statute, the return check fee is $50. Repeat return checks may result in the restriction of this payment option for future semesters. Checks used to pay past due balances and/or to release holds for registration that are later returned unpaid by a financial institution may result in the immediate suspension of academic services. Returned checks that create a balance will be sent a written or electronic notice, and a financial hold will be placed on the account until the balance is
paid in full. Certified fund payments such as cash or cashier's check are required for immediate hold release. Waiting periods will apply for other payment methods.

Financial Good Standing; No Holds on Record

Financial good standing and a university record clear of holds are required for students to receive academic services. Services, including but not limited to transcript issuance, diploma release, and class registration (add, drop, withdrawal, etc.) will not be provided to students with a financial balance due or a hold of any kind on their record. Holds are based on outstanding obligations and may be financial. Examples include unpaid telephone charges, fines owed to the Mason or Washington Research Library Consortium libraries, parking and other administrative holds.

Students in noncompliance with payment deadlines as of the end of the semester will be required to submit a financial guarantee or prepayment prior to future registration. The return of the prepayment by a financial institution will result in the immediate suspension of academic services.

Collections

Failure to meet financial obligations to the university will result in other collection procedures, which include account referral to credit reporting bureaus, private collection agencies, the Commonwealth of Virginia Department of Taxation, and the Office of the Attorney General. Past due accounts are subject to garnishments, liens, and judgments and the withholding of money from tax refunds. In addition to late fees and interest, delinquent accounts will be assessed additional collection costs equal to thirty percent of the past due balance, reasonable attorney fees, and other administrative costs.

Course Withdrawals

Students are required to pay full or partial tuition for courses they withdraw from after the last day to drop with full tuition refund, including withdrawals to change from one section of a course to another section. For more information, see the tuition liability dates in the Academic Calendar.

Refund Policies

Refund for Credit Balances

In cases where tuition charges are less than the payments on the student's account, a refund of the overpayment may be requested. To initiate the refund process, a Refund Request form is completed and submitted to the Student Accounts Office. Refund will be processed according to the method of payment received:

- Cash payments are sent in the form of a check, without a waiting period.
- Payments made by check require a seven day waiting period. The waiting period may be waived if proof of check clearance is presented, such as a canceled check copy or bank statement showing that the check cleared the account.
- Credit card payments are credited back to the credit card that was most recently used for payment.

Refund checks are made payable to the student and are mailed to the address listed in the student record. Check pick up in person is not available due to negotiable item security and the large number of checks processed.

Direct Deposit Refunds

The option to have check refunds sent electronically is available by submitting a Direct Deposit Authorization form, which can be found on the Student Accounts Office web site. A checking account is necessary for this refund option. Direct deposit refunds are not available for Parent PLUS loans.
Financial Aid Refunds

Credit balances from financial aid awards will automatically generate a refund check, which will be mailed to the address on file with the university or sent via direct deposit if authorized by the student. A refund request form is not needed for financial aid disbursement refunds.

Special Registration

Students not enrolled in a credit-bearing course, but whose academic department certifies that they are pursuing an activity related to Mason matriculation, can retain active status by having the Office of the University Registrar process a registration for the Special Registration course (ZREG 200). A $45 fee is charged for this course, and students must pay this fee before the University Registrar's office will process the registration. Written approval of the student’s advisor or instructor and the academic department chair is required. This special registration allows students to retain their library and computer privileges, receive a student ID, and buy a parking decal. Students must have active status to apply for or receive a degree, take an exam, or participate in cooperative education. Students pursuing a master’s or doctoral degree must maintain continuous enrollment. For more information, see the Graduate Policies section.

International Student Health Insurance

Health insurance is required for all F-1 and J-1 visa holders, and nonpayment may result in class cancellation. The health insurance fee is deducted from all payments received by the university before funds are applied to tuition or other charges. For more information, see the Admission of International Students section in the Admission chapter.

Music Instruction

Private music instruction is arranged through the School of Music on a fee-paying basis. Refer to the Student Accounts Office web site for up to date fee information. This fee is non-refundable.

In-State Tuition

To be eligible for in-state tuition, a student must have been domiciled in Virginia for at least one full year before the semester for which in-state tuition is sought, or qualify through statutory exception. A person establishes domicile by demonstrating physical presence and the intention to remain indefinitely in accordance with the Code of Virginia and the domicile guidelines. Copies of the guidelines and other applicable state laws are available from the Office of the University Registrar or at registrar.gmu.edu/students/domicile.

Domicile Change

Domicile classification is determined at the time of a student’s admission. To be considered for in-state status when applying to the university, students must file an application for in-state rates.

New and currently enrolled students classified as out-of-state who believe they qualify for in-state tuition after being admitted must file a domicile appeal form with the Office of the University Registrar no later than the first day of classes for the semester in which in-state rates are sought. Appeal forms are available from the Office of the University Registrar and at registrar.gmu.edu/students/domicile.

Students whose appeals are denied have the right to seek further review of their status by the Office of the University Registrar or the Third Level Domicile Appeals Committee. These requests must be filed in the manner articulated in denial letters. Forms are available from the Office of the University Registrar and the web site. In addition, students should be aware that university procedures for appealing domicile decisions have been established pursuant to state law and are subject to change. Out-of-state
students with an appeal pending at the time of tuition billing are responsible for payment of tuition at that rate. Students subsequently determined to be in-state may request reimbursement of overpayment from the Office of Student Accounts. Also, any student who fraudulently or knowingly provides false information in an attempt to evade payment of out-of-state tuition will be charged out-of-state tuition for each term or semester attended and may be subject to dismissal from the institution.

For more information regarding in-state eligibility, contact the Domicile Appeals Administration in the Office of the University Registrar in Student Union Building I, Suite 2101; phone: 703-993-2464; e-mail:domicile@gmu.edu.

**Tuition Surcharge: 125 Percent of Degree**

Undergraduate students who have established Virginia domicile and eligibility for in-state tuition will be subject to a surcharge if they exceed 125 percent of the credits required to complete a degree. The surcharge will be determined by the State Council for Higher Education in Virginia.

The following courses and credit hours shall be excluded in calculating the 125 percent credit threshold: remedial courses; transfer credits from another college or university that do not meet degree requirements for general education courses or the student’s chosen program of study; advanced placement or international baccalaureate credits that were obtained while in high school or another secondary school program; and dual enrollment, college-level credits obtained by the student prior to receiving a high school diploma.

**Expenses**

**Housing**

Office of Housing and Residence Life  
Ground floor of Potomac Heights  
Phone: 703-993-2720  
Web: housing.gmu.edu

The university offers a variety of housing options to meet the diverse needs of students living on campus. Upper-class students may choose from suites, suites with kitchens, and townhouses. Most freshmen live in traditional-style residence hall rooms that accommodate two, three, and four students. Room rates are subject to approval on an annual basis by the Board of Visitors. Rates for the 2012–13 academic year should be available in May 2012. Please refer to the Housing and Residence Life web site for rate information. All students in housing must provide a prepayment, which gets applied to the fall semester rent. Housing assignments, including single rooms, are made on a priority and space-available basis. The web site provides extensive information about housing programs and services and includes floor plans for most student rooms.

Students living on campus are required to sign an academic year contract. Releases from the contract are generally granted only in cases of hardship and involve a financial penalty. For more information, contact the Office of Housing and Residence Life.

**Mason Dining**

Mason Dining  
Southside Dining Hall, First Floor  
Phone: 703-993-3300  
Web:dining.gmu.edu

Mason Dining is proud to serve the Mason community with over 27 restaurants, kiosks and carts among the Arlington, Fairfax, and Prince William campuses. Southside, located on the Fairfax campus, offers
extensive menus with the highest quality ingredients and seasonal produce. Mason Dining is committed to nutrition, wellness, and sustainability.

**Meal Plans and Mason Money**

Meal Plan & Mason Money Office  
The HUB, lower level  
Phone: 703-993-2870  
Web: mealplans.gmu.edu or masonmoney.gmu.edu

Both resident meal plans and patriot meal plans are available for students to purchase. These plans allow for tax-exempt dining and are billed to the student account. Most students living on campus are required to participate in the resident meal plan program. Detailed information is available on the web site.

Mason Money, accessed with the Mason ID, is accepted at various venues on campus and also with participating merchants off campus. Funds can be deposited at the Mason Money office or online at masonmoneyonline.gmu.edu.

**Parking Services**

Fairfax Campus, Sandy Creek Parking Office  
Phone: 703-993-2710

Arlington Campus, 219 Founders Hall  
Phone: 703-993-8146

Prince William Campus, 112 Occoquan Building Office  
Phone: 703-993-4808

Web: parking.gmu.edu

Students who park their vehicles on university property must register them with Parking Services and pay a fee for a parking permit. Permits are available on an annual, semester, or summer basis. For permit sales, fine payments, special requests, or problems, go to any Parking Services Office. Some services are available on-line at parking.gmu.edu. The Fairfax Campus Sandy Creek Parking Office hours are 8:30 a.m. to 7 p.m. Monday through Thursday and 8:30 a.m. to 5 p.m. on Friday. For more information, read the Parking Policy section in the General Policies chapter of this catalog, or go to parking.gmu.edu for current information and rates.

**Financial Aid**

Office of Student Financial Aid  
SUB I, first floor  
E-mail: finaid@gmu.edu  
Phone: 703-993-2353  
Fax: 703-993-2350  
Web: financialaid.gmu.edu

The Office of Student Financial Aid provides a variety of services to help students finance their education. They include counseling, referral and information resources, and financial assistance. Student financial aid awards consist of grants, loans, and work-study. Awards are based primarily on financial need, although there are some alternative resources available for those who may not qualify for need-based aid.

The office has a comprehensive listing of various scholarship opportunities for students to research on the Student Financial Aid web page. Students are encouraged to review the scholarship information early and frequently to meet deadlines since the listings are updated often.
Located in Student Union Building I, the office is open 9 a.m. to 5 p.m., Monday through Friday. Financial aid counselors are assigned to students alphabetically based on students’ last names and are available daily by appointment.

To apply for financial aid, each year new and currently enrolled students must complete a Free Application for Federal Student Aid (FAFSA). George Mason’s federal school code for the FAFSA is 003749. Priority consideration for all sources of financial aid is given to those students whose financial aid applications are on file with the Office of Student Financial Aid by March 1. To meet this priority filing date, students should file the FAFSA as soon as possible after January 1. The FAFSA can be filed on-line at www.fafsa.ed.gov.

Financial aid for summer is generally limited to students who have remaining Federal Pell Grant or federal loan eligibility. Contact the Office of Student Financial Aid for specifics regarding eligibility. The summer aid application is available on-line and in the office on April 1.

All students receiving financial aid must be enrolled in an eligible degree or certificate program for at least half time in any given semester; maintain satisfactory academic progress as defined by the Office of Student Financial Aid, in accordance with federal guidelines (see below); and be a U.S. citizen or eligible non-citizen as defined by the U.S. Department of Education.

All aid recipients are responsible for becoming familiar and complying with applicable federal and state laws, university regulations, Mason student aid information resources, and the student aid satisfactory academic progress policy. This policy is detailed in the Office of Student Financial Aid website.

**Academic Progress Standards**

Federal legislation governing the administration of federal programs requires colleges and universities to define and enforce standards of progress for students receiving or applying for financial aid. To comply with this legislation, the Office of Student Financial Aid has established a formal satisfactory academic progress policy. For detailed information, go to the Student Financial Aid home page at financialaid.gmu.edu or contact the Office of Student Financial Aid.

**Aid Programs**

The university administers the following federal, state, and other aid programs:

- **Federal programs**: These include the Federal Pell Grant, Federal Supplemental Educational Opportunity Grant (FSEOG), Federal Work-Study (FWS), Federal Perkins Loan Program, Federal Subsidized Stafford Loans, Federal Unsubsidized Stafford Loans, Federal PLUS Loans for parents of dependent students (DPLUS) and Federal Grad PLUS Loans for Graduate students (DGPLUS). For more information, refer to the Student Guide for Federal Financial Aid, which is available in the Office of Student Financial Aid, or go to the Student Financial Aid home page at financialaid.gmu.edu.

- **State programs for undergraduate Virginia residents**: Eligibility for all state programs is based on results received from the FAFSA. State grant funds are limited, so adherence to the March 1 priority filing date is critical.

- **Virginia Commonwealth Award**: This program is open to undergraduate students who have demonstrated financial need, are enrolled at least half time, and are domiciliary residents of Virginia.

- **Virginia Guaranteed Assistance Program (VGAP)**: This program is a component of the Virginia Commonwealth Award Program that is open to students who demonstrated academic achievement in high school. VGAP awards are renewable for up to four years.

- **College Scholarship Assistance Program (CSAP) Grant**: This program uses a combination of federal and state funds to provide additional assistance to students who are enrolled at least half time, are Virginia residents, and who demonstrate significant financial need.

- **Graduate student assistance**: Assistantships, fellowships, and scholarships exclusive of the federal financial aid programs identified earlier are administered by the individual graduate programs. Students interested in pursuing graduate assistantships, fellowships, or scholarships should contact their graduate program.
**Emergency Loan Programs**

George Mason University has established emergency loans in memory of the following individuals:

Doug Beaman, Mary E. Ferguson, Lisa Kenaga and the Gerson Trust.

These emergency loans are designed for students that encounter unexpected emergencies and are not meant to pay for tuition and fees. These are short-term, interest free loans and students may borrow up to $1000. Repayment is due in 90 days. Applications may be obtained from the Office of Student Financial Aid.

**ROTC Scholarships**

Please see the Reserve Officer Training Corps section in the University Academic Programs and Resources chapter.
Course Information

Return to: Academic Policies

- General Information
- Contact Hours
- Undergraduate Numbering
- Graduate Numbering
- Green Leaf Programs and Courses

General Information

Each course indicates:

- the number of credits earned;
- the repeat status;
  - NR - Not Repeatable, RT - Repeatable in Term, RD - Repeatable in Degree
- prerequisites;
- corequisites;
- the hours of lecture or seminar per week;
- the hours of laboratory or studio per week (if applicable); and
- semester offered.

Individual instructors set hours for independent study, readings, topics, or similar courses. If a course is listed as having an equivalent course, students may not receive credit for both courses.

Contact Hours

University course work is measured in terms of quantity and quality. A credit normally represents one hour per week of lecture or recitation, or not fewer than two hours per week of laboratory work, throughout a semester. The number of credits is a measure of quantity. The grade is a measure of quality.

Undergraduate Course Numbering

Courses numbered 499 and below are undergraduate courses. Course numbers in the 100 series are customarily taken by freshmen, the 200 series by sophomores, the 300 series by juniors, and the 400 series by seniors.

Graduate Course Numbering

Graduate courses are divided into the following categories:

- 500–699: Open only to graduate students admitted to master’s or doctoral programs; other bachelor’s degree holders; and approved, advanced undergraduate students. Advanced undergraduate students who have secured the permission of the department offering the course may select from these courses to accumulate the hours necessary to complete an undergraduate degree. With the written permission of the dean of their college, they may take these courses for reserve graduate credit.
- 700–799: Open only to students admitted to graduate degree or certificate programs.
- 800–999: Primarily doctoral courses open only to students admitted to graduate degree programs.
Degree programs may extend permission to enroll bachelor’s degree holders.

Courses with the following numbers are reserved for the uses designated:

- **600–609**: Limited applicability, graduate-credit courses, normally intended for in-service professional development and not directly leading to a graduate degree. A limited number of credits from these courses may be applied to a graduate degree.
- **798**: Master’s research
- **799**: Master’s thesis
- **800**: Studies for the doctor of philosophy in education program
- **998**: Doctoral dissertation proposal
- **999**: Doctoral dissertation research
- **790, 890**: Supervised practicum
- **794, 894**: Internship
- **796, 896**: Directed reading and research courses for master’s and doctoral students
University Academic Programs and Resources

- University Libraries
- Office of the Ombudsman
- Honors College
- University Scholars Community
- University Courses
- Bachelor of Applied Science
- International Programs and Resources
- Office of Continuing Professional Education
- Army ROTC
- Air Force ROTC
- Oak Ridge Associated Universities (ORAU)
- Smithsonian Mason School of Conservation (SMSC)
- Center for Global Studies
- The Research Office

University Libraries
Phone: 703-993-2250
Web: library.gmu.edu

Administration

John G. Zenelis, University Librarian and Associate Vice President, Information Technology Fenwick Library, Room A227

Diane H. Smith, Associate University Librarian for Research and Educational Services

Clyde W. Grotophorst, Associate University Librarian for Digital Programs and Systems

John C. Walsh, Associate University Librarian for Resources and Collection Management Services

Professional Faculty


Administrative Faculty

Dixon, Kehoe, Mariner, Perry, Stockwell

Resources and Services
Resources and services of the George Mason University Libraries are housed on the Fairfax Campus at the Charles Rogers Fenwick Library and the George W. Johnson Center Library; on the Arlington Campus at the Arlington Campus Library; and on the Prince William Campus at the Mercer Library. The School of Law Library, on the Arlington Campus, is administered separately. Combined holdings, including the law library, total more than 1.3 million books and bound journal volumes; 13,000 current print serial subscriptions; 3.2 million microform units; 344,000 print government documents; 214,000 maps; 46,000 multimedia materials; 700 electronic databases; 58,000 electronic journals and proceedings; 5,400,000 electronic books; and significant holdings of manuscripts, special collections, and archives.

Mason’s integrated library information system provides an online public-access catalog, circulation, electronic reserves, and library-processing services. The information system can be used in any of the libraries from campus locations on the network or via the web. The web site library.gmu.edu offers access to a variety of networked digital resources and electronically mediated services, including a virtual reference service.

Liaison librarians work with faculty and students in specific academic programs and departments to promote new resources such as research portals; consult with faculty about acquiring specific scholarly resources; assist graduate students with thesis or dissertation research; and conduct informational and training sessions for all levels of library users—students, faculty and staff. These may include library orientations; course-related, subject-specific instruction; research consultations with individual students or faculty; and methodology instruction related to information discovery and use, research analysis, and data manipulation through specialized software. Current affiliations include the following:

- The Virtual Library of Virginia (VIVA) Program, a Virginia-funded electronic and resource-sharing program for public higher-education institutions
- Washington Research Library Consortium (WRLC), whose membership includes American, Catholic, Georgetown, George Washington and Howard universities, provide resource sharing services;
- Association of Southeastern Research Libraries, which includes the 36 largest university libraries in a 10-state region
- Center for Research Libraries, a Chicago-based research library for research libraries whose multimillion volume holdings comprise specialized and uniquely held materials in North America and
- The international Online Computer Library Center, whose extensive computerized system and network facilitate national and international library resource-sharing activities.

An intercampus delivery service is available for students and faculty requesting materials held at any Mason campus library. Materials not held by Mason can be obtained by direct borrowing from WRLC institution libraries via the Consortium Loan Service, interlibrary loan, or commercial delivery services when required.

Expanded academic support services also include the following:

**Data Services**

Web: dataservices.gmu.edu

An integrated service supports faculty and students engaged in data-centric research (e.g., social science data sets, polling data, census data, geospatial data, data archives). Includes consultation services and assistance with finding and using data sets, utilizing data analytic tools such as statistical and Geographic Information Systems. Other services offered include help with statistical and qualitative software packages, access to government information and maps, and research data management.

**Educational Services Unit**

Web: library.gmu.edu/education/

The Educational Services Unit leads planning and program development for information literacy initiatives throughout all the libraries and, through collaboration with other university units, creates institution-wide projects and initiatives focused on students’ research abilities. The Educational Services Unit staff designs classes, tutorials, instructional materials, and program-level plans to teach students how to identify, assess, and manage information for their academic courses and other endeavors, and
conduct research in an ethical way. This unit is also responsible for leading assessments related to information literacy and fluency projects.

**iMasonLibraries Service**

Web: library.gmu.edu/research

This service provides a virtual, real-time, reference service using instant messaging software, which allows staff to provide reference service to students, faculty and staff remotely.

**Mason Archival Repository Service**

Phone: 703-993-3742
Web:mars.gmu.edu

The Mason Archival Repository Service (MARS) provides a stable digital archive for scholarly and research materials of lasting value held notably by Special Collections and Archives or produced by Mason faculty, students, and staff. MARS is managed by Digital Programs and Systems. The MARS librarian offers expert advice on archiving these materials, file formats, copyright issues, long-term management of archived materials, and issues pertaining to scholarly communication.

**Records Management**

Phone: 703-993-2201

A part of the Special Collections and Archives, this service assists university academic and administrative departments with the retention and disposition of temporary records by providing a number of online resources to members of those departments. The records manager works with members of university departments to ensure that records are retained, retrieved, managed, and disposed of appropriately, in accordance with Virginia state laws, policies, and guidelines.

**University Copyright Resources Office**

Johnson Center, Rooms 227 EB
Phone: 703-993-2544 or 2427
Fax: 703-993-4116
Web:library.gmu.edu/copyright

This office provides guidance and assistance on copyright and fair use issues, including copyright use in classroom teaching and technology, online courses, distance education, university publications, university web sites, networked library collections and related services, electronic course reserves, course readers, and scholarly communication concerns. Workshops are offered on a regular basis.

**University Dissertation and Thesis Services**

Phone: 703-993-2222
Web:thesis.gmu.edu

The University Dissertation and Thesis Service (UDTS) assists students and academic units in the dissertation, thesis, and graduate-level project process by helping students meet all university requirements and deadlines for submission of work. The UDTS web site provides useful tools such as the university’s *Thesis, Dissertation, or Project Guide*, which contains downloadable templates of necessary elements, forms required for the submission process, and links to related web sites. UDTS also assists graduate students through individual consultation and informational workshops.
Fenwick Library

Phone: 703-993-2240

Fenwick is the main library in the university’s library system. It holds most of the book collections across disciplines, as well as current and bound journals, microforms, special collections and archives materials, federal and Virginia government documents, and maps. Instruction and reference classes are available in search strategies, information sources, and information technology. In addition, publicly accessible computer workstations and data ports for laptop use enable access to the entire system’s electronic resources and associated services.

Johnson Center Library

Phone: 703-993-9060

This library is part of the George W. Johnson Center integrated learning environment. Electronic access to scholarly information is complemented by a print-reference collection, multimedia collections, and a circulating book collection comprising core texts and readings supporting the university’s undergraduate curriculum. This library, in particular, supports interdisciplinary programs such as the Honors College and New Century College through its collections and outreach services. The library also holds designated discipline-based circulating book collections. It is the center for multimedia collections and services for the university library system. This library also provides course support through reserve materials (electronic, print, and media) for students and faculty on the Fairfax Campus and manages the entire electronic reserves service. Assistive technologies include screen-reading software, text-enlargement software, and special hardware for individuals with disabilities.

Arlington Campus Library

Phone: 703-993-8188

This library is a full-service research facility supporting the teaching and research needs of Mason faculty, students, and staff on the Arlington Campus. Consistent with this campus’ distinct areas of academic specialization at the graduate level, the library’s collection emphasizes public policy, international commerce, economics, education, management of nonprofit organizations, conflict resolution and social work. The library holds a core of reference materials and is a depository of European Union documents. Intercampus delivery of circulating materials from other library sites is also available. Library staff can provide reference assistance and instruction for students, faculty, and staff in identifying and using resources. Physical library holdings continue to grow, while the library emphasizes providing many of its resources and services online. This library supports a wireless network. Assistive technologies are available for people with disabilities.

Mercer Library (Prince William Campus)

Phone: 703-993-8340

This library supports faculty and students in the programs and courses offered at the Prince William Campus, including education; biotechnology, bioinformatics, and biodefense; computer and information networking; education; and health, fitness, and recreation resources. The library provides access to university-wide electronic resources, with an emphasis on instruction and assistance with information resources and research. Notable holdings include scientific journals in bioscience and biomedicine. The library is fostering partnerships to provide information services to the rapidly expanding corporate and technology presence in Prince William County. This library has a wireless network, as well as assistive technologies for people with disabilities.

School of Law Library (Hazel Hall, Arlington Campus)

Phone: 703-993-8120 (circulation desk)
Administration

Deborah M. Keene, Associate Dean, Library and Technology

The law library supports the School of Law and has a collection of over 473,000 print and microfiche volumes with an emphasis on law and economics, intellectual property, corporate and securities law, regulatory law, and Virginia law. The library also provides access to electronic law resources including LexisNexis, Westlaw, HeinOnline, Index to Legal Periodicals, Bloomberg Law and BNA Premier and is a selective depository for U.S. Government documents. The law library is open to all members of the university community. Most of the collection does not circulate, but many of the books in the treatise collection are available for checkout by all faculty, students, and staff. The law library provides free access to many of its databases on computer workstations located on the first and second floors. The university operates a full-service copy center inside the library which is located on the entrance level.

Office of the Ombudsman

SUB I, Suite 3313
Phone: 703-993-3006
Email: ombuds@gmu.edu
Web: ombudsman.gmu.edu

Administration

Dolores Gomez-Moran, University Ombudsman

The Office of the Ombudsman is a neutral, independent, informal, and confidential resource to facilitate fair, equitable, and expeditious resolution of university-related concerns and problems raised by students. The ombudsman is an advocate for fairness and the equitable treatment of students, operates independently of all formal grievance processes at the university, and considers all sides of an issue in an impartial and objective manner. The ombudsman has no authority to make exceptions or to grant requests, but can perform informal investigations and, as a result, may recommend actions that lead to changes in processes and policies at the university. Meetings with the ombudsman are confidential. The ombudsman serves graduate and undergraduate students at the university.

Honors College

Enterprise Hall, Room 302
Phone: 703-993-1110

Administration

Zofia Burr, Dean

The Honors College focuses attention on the excellence of Mason's student body and highlights the full spectrum of opportunities for academic achievement, professional development, and public service that Mason offers our most highly-motivated undergraduates. The Honors College provides talented students in all majors with an enriched academic and social environment that enhances their college experience. Through participation in unique, innovative, and challenging programs, students develop their full potential to lead and be active members of their local, national, and global communities.

By incorporating multiple resources into the Honors College, the university provides students the support to excel academically and in their life-long pursuits. Included in these resources is the Honors Program curriculum, which offers challenging courses that fulfill core academic requirements at Mason. Senior faculty, including Mason’s Robinson Professors, teach small classes of students taking the curriculum. From among the candidates invited to be a part of the Honors College, a small cadre of
outstanding students are selected as University Scholars, Mason’s highest academic distinction. The Undergraduate Apprenticeship Program provides a research stipend to selected students who wish to work closely on a research or creative project with a faculty mentor of their choosing. Additionally, all Honors College students have direct access to the Postgraduate Scholarships and Fellowships Program, which provides advice and information to high-achieving Mason undergraduates and recent alumni about the application process for nationally competitive fellowships.

The benefits of being part of the Honors College include the option of living in a diverse living-learning community. Activities include special lectures, events, and field trips on and off campus, as well as distinctive opportunities to take advantage of internships and cultural programs in Washington, D.C.

All students in the Honors College receive individualized academic advising, priority registration, and opportunities for close interaction with faculty for one-on-one mentoring and graduate and professional advising. The Honors College also offers competitive study abroad scholarships for students in their junior or senior years.

**University Scholars Program**
Honors College
Enterprise Hall, Room 302
Phone: 703-993-1110

The University Scholars are selected from among the most outstanding students invited to the Honors College. This award is the highest academic distinction that Mason offers to undergraduate students and is given annually to top high school seniors admitted to the university. Each year the University Scholars Program enrolls approximately 25 new first-year students. Students receiving this award have demonstrated superior academic achievement, outstanding leadership, and an exemplary school and community service record. Applications must be submitted by December 1 to receive priority consideration for the scholarship.

The University Scholars reside in a common residence hall their first year and share the Dr. Noreen McGuire Prettyman University Scholars Lounge. Students enrolled in the University Scholars Program participate in a dynamic learning community that provides opportunities for intellectual, cultural, and social engagements.

The program draws to Mason a special caliber of student, one who is actively involved in all facets of academic and student life. In addition to excelling in their respective academic areas, the Scholars have historically emerged in a variety of student leadership positions and service-related activities.

Intellectual dialogue is fostered among scholars, professors, and administrators through stimulating seminars, discussion groups, cultural activities, service projects, internships, campus events, and participation in organizations that complement the Scholars’ academic experiences. The peer interaction, faculty guidance, student development programming, and the academic focus of the University Scholars community reflect the university’s commitment to providing an educationally stimulating and supportive environment that encourages academic excellence, professional development, and personal growth.

**University Courses**

University (UNIV) courses are special undergraduate academic seminars that appeal to a wide range of majors. These courses fall into three general categories: transitional, interdisciplinary honors, and special topics. To encourage interaction between students and faculty, many of these courses have smaller class sizes. Some UNIV courses satisfy general education requirements; see the University General Education section of this catalog.

**University Transitions Courses**

This series of courses focuses on transition through the various stages of college. UNIV 100, helps freshmen adjust academically, develop decision-making skills, and learn about the services and opportunities for involvement on campus. UNIV 101, Freshman Academic Transition focuses on academic transition and development issues for second semester freshmen. A special emphasis
is placed on resources and techniques to assist students with assessing and improving their academic performance. Students will work closely with their instructor to track their academic progress over the course of the semester. UNIV 200 topics focus on choosing a major or career. UNIV 300 has three tracks: the first is for transfer students making the transition to a new university, the second focuses on career readiness for internships and research assistantships, and the third is designed for specific groups of student leaders. UNIV 400 emphasizes preparation for the workplace, graduate school, and life responsibilities.

University Interdisciplinary Honors Seminars

These seminars are offered to students who have demonstrated strong academic performance. They are developed to give high-ability freshmen and advanced-standing students the opportunity to study with a senior professor in a small classroom setting. The Freshman Seminars (UNIV 190) are open to eligible first-year students and are taught exclusively by the Robinson professors. Qualified students with 30 or more credits are invited to participate in the UNIV 390 seminars, which are taught by Robinson professors and other distinguished faculty scholars.

University Special Topics Courses

Upper-level University courses are open to all students unless specific prerequisites are indicated. They are usually repeated offerings. Two regularly offered University courses, each worth 3 credits, are UNIV 301 Great Ideas in Science and UNIV 441 AIDS: Its Impact in Our Society.

Bachelor of Applied Science (BAS)

Administration

Academic Director: Janette Kenner Muir, Associate Provost for Undergraduate Education
Program Administrator and BAS Advisor: Darren Troxler, Director of Admissions Operations

The Applied Science, BAS is an undergraduate liberal arts degree program. It is designed primarily to deepen student knowledge in an academic area and foster critical thinking, analytic reasoning and an ability to synthesize information.

The BAS articulates well with specialized applied associate degree programs, providing a streamlined path to completion of traditional academic requirements leading to the baccalaureate degree. It meets students’ professional and personal goals while developing a depth of knowledge and proficiency of skill that translates well to the workplace. However, it is not organized in the same way as a traditional baccalaureate degree, and the student’s area of specialization will not be formally identified on the transcript. Students planning graduate study should consult with an academic advisor prior to undertaking this degree program.

Admission

As a prerequisite to enrollment in the BAS, students must receive an Associate of Applied Science (AAS) degree from an accredited two-year institution in an approved area of specialization. The AAS degree will normally fulfill most, but not all, of Mason’s university general education requirements.

International Programs and Resources

Office of Global and International Strategies
Administration

Dr. Anne Schiller, Vice President for Global Strategies

The Office of Global and International Strategies provides leadership and support to a university committed to realizing its global goals. It assists faculty, students, and units to pursue international activities, including through coordination of efforts across units and beyond borders. The office represents Mason’s global interests to government and non-governmental agencies, business and community leaders, and educational partners around the world. It also serves as an incubator for innovative projects through which Mason faculty and students engage with counterparts across the globe.

Center for Global Education: Study-Abroad Office

Johnson Center, Room 235
Phone: 703-993-2154
Fax: 703-993-2153
Web: globaled.gmu.edu
E-mail: cge@gmu.edu

Administration

Dr. Yehuda Lukacs, Director

The Center for Global Education (CGE) offers students the opportunity to challenge their assumptions about themselves and other cultures in an educational environment by offering study-abroad programs of varying lengths, academic emphasis, and locations. Students can discover new cultures, sharpen language skills, and travel while earning credit. Study options include faculty-led, short-term study tours and intensive language programs; semester and year-long Mason-sponsored programs; direct exchange programs and international internship programs. Most programs are open to Mason undergraduate and graduate students and short-term programs are also open to faculty, staff, and the general public.

CGE offers a wealth of resources to help create a personalized international experience, including information sessions about study-abroad and internship options; one-on-one student advising; transfer of approved international program credits; a resource library of travel books; international and diplomatic community programming; advising to international students from partner schools; and International Student Identity Cards.

English Language Institute

Northern Neck, Room 108
Phone: 703-993-3660
Fax: 703-993-3664
E-mail: ELI@gmu.edu
Web:eli.gmu.edu

Administration

John Pope, MA, Executive Director
Baotran Beaslon, MA, Associate Director
Karyn Mallett, PhD, Assistant Director
The English Language Institute (ELI) provides instruction in English as a second language to develop students’ language and academic skills, as well as cultural awareness necessary for academic, personal, and professional success. ELI offers two programs: the Intensive English Program, which serves international students who have come to the United States to study English in preparation for academic study at an American college or university, and the Support Services Program, which provides programs for nonnative, English speaking students newly admitted to Mason and other international members of the campus community. ELI also provides contract services to private corporations, embassies, and government agencies.

Office of International Programs and Services

Phone: 703-993-2970
Web: oips.gmu.edu

Administration

Judith Green, MEd, Director

The Office of International Programs and Services (OIPS) advises and consults on matters affecting non-immigrant students, scholars, faculty, staff, and families at Mason. Staff members provide regulatory information related to non-immigrant status and have been designated by the university to issue and sign immigration documents and paperwork on behalf of the institution. OIPS advisors are available by appointment to discuss any concern and to provide practical assistance to students and scholars as they adjust to U.S. culture. OIPS conducts a comprehensive orientation program for new international students and offers social and cultural programming throughout the fall and spring semesters. Most notably, the staff works with student groups and the Student Activities Office to coordinate Mason’s International Week held annually in April.

International/Multicultural Student Organizations

Phone: 703-993-2909
E-mail: isu@gmu.edu

The International/Multicultural Student Organizations consist of a variety of international/multicultural student organizations that coordinate educational and social activities to promote cross-cultural understanding and international awareness.

International Student Association

Phone: 703-993-2970
E-mail: oips@gmu.edu

The International Student Association is a group of students from around the world who work together to assist newly arriving students and meet for fellowship and fun. Their goal is to make all students feel welcome and comfortable at George Mason University and to participate in activities with classmates of various cultures and backgrounds.

Office of Continuing Professional Education

Fairfax Campus
University Hall, Suite 2300
Phone: 703-993-2109
Web: ocpe.gmu.edu

Prince William Campus Professional Development Office
Phone: 703-993-8335
The Office of Continuing Professional Education (OCPE) serves as Mason’s initial point of contact and referral for the business and professional community, and responds to all professional development and continuing education inquiries, requests, and needs. Supported program activities include contracted academic credit programs, noncredit public programs and seminars, online courses, professional certificate programs, continuing education units (CEUs), on-site contract training programs, special professional development events and programs, special workforce development programs, and training center facilities.

The OCPE is strategically located at the Fairfax Campus in University Hall, the Prince William Campus, and the Center for Innovative Technology (CIT) in Herndon. Current continuing education program information, offerings, and capabilities can be reviewed at ocpe.gmu.edu.

The University Hall office serves as the primary point of inquiry and referral. It facilitates, promotes, and administers the delivery of contract credit courses, online courses, and other specialized non-credit professional development programs. This office also administers the award of CEUs, which are nationally recognized standard units of measurement earned for satisfactory completion of qualified programs of continuing education. OCPE provides this service to all Mason academic groups that deliver noncredit professional development programs.

The Prince William Campus office facilitates a variety of open enrollment and contract programs (both noncredit and credit) that support the strengths of the programs on that campus. Programs are designed to meet the professional development needs of the business community of the Prince William area, as well as Northern Virginia local and state government communities.

The OCPE Herndon Office located in CIT in Northern Virginia’s high-technology corridor facilitates a variety of professional development programs targeted to the area’s business and federal government organizations. This office reaches out to the business community by designing, marketing, and delivering noncredit training courses and in-depth certificate programs. Public seminars and customized, contract training programs respond to the needs and interests of managerial, technical, and professional employees in private, nonprofit, and public organizations located in Northern Virginia and the broader metropolitan area.

The Army Reserve Officers’ Training Corps (ROTC) is an elective program offering qualified students the opportunity to earn a commission as an officer in the U.S. Army, Army National Guard, or U.S. Army Reserve while pursuing a baccalaureate or graduate degree as a full-time student. The program emphasizes student learning and participation in applied leadership, leadership theory, decision making, management skills, time management, ethics and military law, logistics, military roles and national objectives, strategic and tactical planning and principles, and basic military knowledge and skills. The George Mason Army ROTC Patriot Battalion began in 1981, achieved independent status in 2000, and frequently conducts training with colleges and universities throughout Maryland, Virginia, and the District of Columbia.
Enrollment

Enrollment in Military Science (MLSC) courses is open to all students at the Basic Course Level. Freshmen (MLSC 100 and 101), sophomore (MLSC 200 and 201), and junior (MLSC 300 and 301) classes are awarded 1 credit each. Senior classes (MLSC 400 and 401) earn 3 credits each. No military service obligation is incurred by enrolling in the freshman and sophomore level Army ROTC courses. Courses can be dropped or added, as with any elective course at Mason.

The four-year program is organized into two successive phases: the Basic Course and the Advanced Course. For students seeking the opportunity to earn a commission as an officer, several entry methods and participation strategies can be used. A minimum of four semesters must remain in the student’s academic curriculum to complete commissioning requirements; these semesters may be part of either an undergraduate or graduate degree. Course descriptions appear under Military Science (MLSC) in the Course Descriptions chapter of this catalog. Cadets must meet established academic standards. A student must maintain an overall GPA of at least 2.00 to earn commissioning credit for ROTC.

Contracted and scholarship cadets of any level are required to pass the Army Physical Fitness Test (APFT) once each semester. Physical fitness training is conducted three times each week (Monday/Wednesday/Friday from 6:30 to 8 a.m.). All students are encouraged to attend in order to develop a lifelong commitment to fitness and health.

Basic Course Curriculum

The Basic Course curriculum is a four-course series (MLSC 100, 101, 200, 201), usually taken in the freshman and sophomore years. Each class awards 1 academic credit. The Basic Course trains students map reading, land navigation, first aid, physical fitness, leadership, ethics, and communication skills. Each lecture class meets once a week for 50 minutes for MLSC 100/101 and 75 minutes for MLSC 200/201. Textbooks are provided free of charge to all enrolled students. Uniforms and equipment are also issued to students at no cost, but students must return them at the end of each semester.

Mason’s Army ROTC program has numerous experiential aspects. The MLSC Leadership Laboratory section encompasses several different activities. Students enrolling in any ROTC lecture class must enroll in the required, nongraded lab section. Only the Professor of Military Science can waive Laboratory enrollment in certain circumstances, such as scheduling conflicts.

All Laboratory sections meet as a combined unit on Thursdays from 1:30 to 4:15 p.m. During this time, Cadets train in a variety of hands-on, practical leadership skills and military tasks, ranging from drills and ceremonies to squad and platoon tactics.

Army ROTC also organizes numerous optional events, including field training exercises (FTXs), rappelling, orienteering, formal social events and military related field trips. The unit has an organized color guard, drill team and an intercollegiate Ranger Challenge competition team. Students also have the opportunity to attend official Army training courses such as basic airborne training and the air assault course. Enrolled students typically become progressively more involved to enhance their training, develop esprit de corps, and take part in social aspects of the program.

Advanced Course Curriculum

The Advanced Course consists of a four-course series (MLSC 300, 301, 400, 401) taken during the junior and senior years. MLSC 300 and 301 earn 1 credit each, while MLSC 400 and 401 earn 3 credits each. Enrollment in the ROTC advanced course requires that students enter into a contract to serve as a commissioned officer in the active or reserve component of the U.S. Army upon graduation. Many graduates elect to apply for service on active duty although ROTC also offers the opportunity of service in either the Army Reserve or Army National Guard.

The 300-level courses emphasize squad and platoon leadership, tactics, and preparation for the Leadership Development Assessment Course (LDAC). LDAC is a four-week training and evaluation event conducted during the summer at Fort Lewis, Washington. Successful completion is a prerequisite for commissioning. Cadets typically attend LDAC in the summer between their junior and senior years; however, they may attend after their senior year if necessary. Salary, travel expenses, and room and board are all provided during the course.
Satisfactory completion of an approved military history course is also required. The department of History and Art History offers a number of 300-level survey courses on the American military experience that satisfy this requirement. Permission of the Professor of Military Science is required prior to substituting any other course.

Upper division ROTC students are also expected to participate in peer mentoring as part of their leadership development. The ROTC peer mentorship program helps students assimilate into the program and helps students prioritize their time to ensure they remain in good academic standing.

Enrollment in the basic course ROTC classes is open to any Mason student. Prerequisites exist for upper-level courses. For more information, see the Course Descriptions chapter of this catalog.

The 400-level courses are considered to be the transition phase to becoming an officer in the U.S. Army. These courses focus on leadership, staff operations, logistics, military law, and ethics. Seniors are expected to organize and attend an additional one-hour staff and training meeting per week as part of their leadership experience and duties. Planning and implementation of training becomes the primary focus for seniors in required laboratories.

**Earning a Commission**

There are several methods by which students may enter Army ROTC to earn a commission as a second lieutenant on graduation:

- Traditional students may complete the four-year program.
- Sophomores may dual-enroll in both years of MLSC freshman and sophomore level instruction to satisfy the lower-level division requirement in a single academic year.
- Veterans with prior college credits may enter directly into the upper-division sequence (if academically aligned as a junior).
- Sophomores may apply to attend a five-week Leader's Train Course (LTC) between the sophomore and junior years to gain experience equivalent to the basic course.

Education delays for graduate study also may be approved for Cadets seeking training as physicians, lawyers or ministers based on needs of the Army. Non-U.S. citizens may participate freely in the lower-division ROTC courses, but must earn U.S. citizenship prior to enrollment in courses requiring a contractual obligation to serve as a commissioned officer.

**Scholarship Programs**

Two-, three-, and four-year ROTC scholarships are available to freshmen, sophomores, and juniors in all majors on a competitive basis as well as to graduating seniors who wish to pursue a two-year master's degree. Students must have a minimum cumulative GPA of 2.50 to apply and be under age 35 when commissioned. Scholarships pay 100 percent of tuition, an annual book allowance of $1,200, and a stipend of at least $300 per month during the school year, all tax free.

A two-year Guaranteed Reserve Forces Duty scholarship is available that guarantees reserve duty upon graduation and commissioning. Students should contact the Professor of Military Science to determine eligibility.

High school students interested in four-year scholarships should apply by December 15 of their senior year for a scholarship that would start in the fall semester of their freshman year at Mason. Contact the Professor of Military Science for details.

Many students participate in ROTC as nonscholarship cadets. A nonscholarship cadet cannot enter into a contract to receive a commission until the sophomore year. For the sophomore, junior, and senior years, nonscholarship contracted students receive a monthly stipend.

**Air Force ROTC**
Enrollment

The Air Force Reserve Officers' Training Corps (AFROTC) provides two programs for college men and women to earn a commission as a second lieutenant in the U.S. Air Force while completing their university degree requirements. To enter the AFROTC program, students should contact 301-314-3242 or go to www.afrotc.umd.edu. Mason students register for the appropriate courses through the Consortium Office located in SUB I, Room 2101. Attendance at courses, located at the University of Maryland, is mandatory. Car pools among Mason cadets are usually available.

Four-Year Program

This program is comprised of a General Military Course (GMC) and a Professional Officer Course (POC). The first two years (GMC), normally for freshmen and sophomores, give a general introduction to the Air Force and its various career fields. Students enrolled in the GMC program incur no obligation and may elect to discontinue the program at any time. The final two years, the POC concentrate on the development of leadership skills and the study of U.S. defense policy. Students must compete for acceptance into the POC. Students enrolled in the last two years of the program regardless of scholarship status will receive a monthly stipend. Juniors receive $450 a month and seniors receive $500 a month.

Three-Year Program

This program is normally offered to prospective sophomores but may be taken by seniors and graduate students. The academic requirements for this program are identical to the four-year program, and students receive the same benefits in their POC years. Students will take both the freshmen and sophomore class to make up the missed first year. Students must start the fall semester of their sophomore year to be eligible for the three-year program. Graduate students should contact the detachment 301-314-3242 for graduate student entrance requirements.

Scholarships

Scholarships are available in many fields and are based on merit. Those selected receive tuition, lab expenses, incidental fees, and a book allowance, plus a nontaxable monthly allowance. For the most up to date information about scholarships available contact the detachment or visit afrotc.com/scholarships/.

AFROTC Awards

AFROTC cadets are eligible for numerous local, regional, and national awards. Many of these awards include monetary assistance for school.

Oak Ridge Associated Universities (ORAU)

Phone: 865-576-3306
Web: www.orau.org
Administration

Roger R. Stough, Vice President for Research and Economic Development; ORAU Councilor for George Mason University
Monnie E. Champion, ORAU Corporate Secretary

Since 1993, the students and faculty of George Mason University have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 98 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with member institutions to help their students and faculty gain access to federal research facilities throughout the country; keep its members informed about opportunities for fellowship, scholarship, and research appointments; and organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility operated by ORAU, undergraduates, graduates, postgraduates, and faculty members enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines, including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the number of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at http://www.orau.gov/orise/educ.htm, or by calling either of the contacts below.

ORAU’s Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU’s members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research, and support programs, as well as services to chief research officers.

Smithsonian Mason School of Conservation (SMSC)

Phone: 703-993-7733 (direct)

Web: mccs.gmu.edu or conservationtraining.si.edu

Administration

A. Alonso Aguirre, Executive Director
R. Christian Jones, Deputy Director

Faculty

Professors: Beach, Jones, Lovejoy, Rockwood
Term Professor: Talbot
Associate Professors: Aguirre, Balint, Birchard, Edwards, Gabel, Jonas, Lucas, Parsons, Wingfield, Wood
Term Associate Professors: Sklarew
Assistant Professors: Forker, Freeman
Term Assistant Professor: McNeil

Affiliate Faculty

Alonso, Brown, Buff, Christen, Dallmeier, Kolowski, Leimgruber, Monfort, Pukazhenti
Coursework

This center offers all coursework designated CONS listed in the Courses chapter of this catalog. All coursework is based at the Smithsonian Conservation Biology Institute in Front Royal, Virginia.

About Mason School of Conservation

Mason School of Conservation (SMSC) is a cooperative local academic unit formed jointly by the College of Science and the College of Humanities and Social Science under the sponsorship of the Provost’s office to provide a home for undergraduate and graduate courses and programs developed through the university’s exciting partnership with the Smithsonian Institution’s Conservation Biology Institute (SCBI) which has recently been christened Smithsonian-Mason School of Conservation (SMSC). SMSC’s programs, co-developed and co-taught by SCBI researchers, are delivered at SCBI’s 3200-acre facility along the Blue Ridge in Front Royal, Virginia, one of the premier conservation research facilities in the world, housing innovative research on some of the rarest species on earth. Students live and learn with prominent research scientists, educators, and conservation practitioners. The undergraduate program provides an innovative semester immersion approach to conservation studies in a learning community framework taking advantage of proximity to SCBI’s scientists, laboratories, and charismatic fauna. Graduate programs are based on a two week intensive residential course format for geared to working professionals with the opportunity to gain a graduate certificate from multiple courses and a path to graduate degrees. The joint program plans to open major new academic and residential facilities at Front Royal in Fall 2012.

Undergraduate Programs

The Smithsonian-Mason Semester is a 16-credit undergraduate program in which students can earn a Minor in Applied Conservation Studies. There are currently two 16 credit packages: “Applied Conservation Strategies” and “Ecology for Effective Conservation Practice”. See the Programs of Study chapter of this catalog for details on the minor and the Courses chapter for details on the courses (select the course prefix CONS). Grounded in natural science, this interdisciplinary semester brings public policy, sociology, conflict resolution, and global awareness to the learning environment. Students majoring in the BAIS program, Biology, Environmental Science, and Global Affairs may be able to fulfill major requirements and/or General Education requirements with Smithsonian-Mason Semester (CONS) credits subject to advisor approval.

Graduate Programs

Graduate students can earn an Applied Conservation Science Graduate Certificate. This certificate is designed for early to mid-career conservation professionals working in government, non-governmental organizations, and research institutions worldwide. Courses are offered in an intensive 1-2 week format at the Smithsonian Conservation Biology Institute.

Center for Global Studies

Phone: 703-993-9433
Web: cgs.gmu.edu

Administration

Terrence Lyons, Co-director and Associate Professor, School for Conflict Analysis and Resolution
Jo-Marie Burt, Co-director and Associate Professor, Public and International Affairs

Dedicated to the promotion of multidisciplinary research on globalization, the Center for Global Studies coordinates outreach efforts in global affairs, facilitating access for external communities to the university’s full range of global expertise. Ongoing activities include hosting guest speakers and visiting scholars, an annual conference, electronic publications, and an annual cycle
of small grants to support faculty research. The center also manages multi-academic unit research projects and a number of regional and thematic working groups.

The Office of Research and Economic Development

The Office of Research and Economic Development has overall responsibility for the university’s research enterprise. Working in an atmosphere characterized by its commitment to cultivating innovation and generation of new knowledge for the benefit of our global society, Mason’s scholars conduct research in an array of disciplines and subjects. The Office works to foster the continuation of these endeavors and to promote an environment that sustains the highest standards of scholarship, health, and safety.

The Office establishes, under the advisement of the Research Council, and administers the policies governing the conduct of research at the university. It also oversees the management of Mason's research programs, assists investigators seeking external funding, and promotes interdisciplinary research. Additional information about Research Administration, the units managed by the Office, and the resources and policies supporting students and scholars conducting research throughout the university, go to research.gmu.edu.
University General Education

University General Education

Janette Kenner Muir, Associate Provost for Undergraduate Education
Office of the Provost
Phone: 703-993-8722
Web: provost.gmu.edu/gened/

All undergraduates seeking a baccalaureate degree must complete the University General Education Program requirements. Additional requirements for specific degree programs can be found in the college or school chapters of this catalog.

Life, Liberty, and the Pursuit of Happiness: A Rationale for General Education at George Mason University

“Life, liberty, and the pursuit of happiness”—this ringing phrase from the Declaration of Independence makes a fine statement about the ideals of general education (or, as it is more classically called, liberal education) as we strive to articulate it at Mason. Let’s take the three parts of Thomas Jefferson’s affirmation of humanity’s “unalienable rights” and see how they apply to the goals of a general, or liberal, education.

Life. A liberal education prepares us for life’s unpredictable, fascinating journey. One sobering truth about formal learning is that no matter how many courses we take or degrees we earn, we can’t master every skill and possess every piece of knowledge that we need to succeed in a dynamic world. A liberal education proposes that the highest value of the college experience is the development of our ability to continue learning, adapting, creating, and responding to an ever-changing society and career environment. A liberal education turns out to be the most practical of all because it never goes out of date; the habits of mind it fosters help us to stay current with our careers and the life of our times.

Liberty. A liberal education takes its name from this part of Jefferson’s phrase; the root word for both the concept we so cherish and the education we practice is the Latin liber, “free.” This kind of education offers to increase our freedom—of thought and action, from prejudice and ignorance. It is the foundation stone of citizenship as Jefferson and his contemporaries envisioned that notion, a liberty built on rights, responsibilities, and respect for differences. A liberally educated person feels free to seek knowledge and wisdom from across the whole spectrum of human experience—free to challenge the assumptions of the past and also, after critical consideration, to accept them.

The pursuit of happiness. The liberal arts tradition provides tools for the pursuit of a happier, more fulfilled life. The definition of happiness is personal; for some, an appreciation of “the best that has been thought and said”—or composed, constructed, painted, danced, or acted—is a necessary condition for happiness. For others, it might be an understanding of the wonder of the natural universe, the ability of humans to create marvelous new inventions, or the complexities of the social fabric in an increasingly borderless world. For still others, it is a call to serve one’s community and world in large and small ways, acting for the betterment of humanity. For most, it is some combination of the above. No matter the specifics; a liberal education offers the joy of discovery and the satisfaction of engagement with the largest questions of our time—and all time.

At Mason, we have created several distinctive ways to experience the excitement and gain the value of liberal education: the University General Education Program, detailed in the following pages; New Century College's Cornerstones program; and, for a small group of outstanding students, the Honors College. Though their approaches differ, as befits the creative spirit and diverse nature of our University, they are united in their commitment to the ideals of Life, Liberty, and the Pursuit of Happiness.
Category Goals and Requirements

University General Education is divided into three sections: foundation, core and synthesis. Each section contains courses that have specific learning outcomes for students and are assessed on a regular basis.

Foundation Requirements

Foundation requirements help ensure that students master the tools and techniques necessary to succeed in college and throughout their lives and careers. These courses emphasize skills—in writing, speaking, and working with numbers and technology—that can be applied to any major field of study and career goal.

Written communication goal: Students develop the ability to use written communication as a means of discovering and expressing ideas and meanings: in short, employing writing as a way of thinking. Students begin this process at the fundamental level in English 101 (100 for ESL students) and build higher-level skills in English 302. Writing will be emphasized in many courses throughout a student’s career, and at least one course in every student’s major is designated “writing intensive.”

- Required: English 101 (or 100), 302, and an approved writing-intensive course in the major.

Oral communication goal: Students develop the ability to use oral communication as a way of thinking and learning, as well as sharing ideas. Courses provide opportunities for students to express themselves in public or group settings, apply critical-thinking skills to public messages, and gain understanding of the cultural, psychological, political, and practical significance of communication, with a special emphasis on the role of communication in a free society.

- Required: One approved course. Students will be expected to continue developing oral communication skills in additional general education courses as appropriate.

Quantitative reasoning goal: Students develop the ability to use and critically evaluate numerical information and create and critique logical arguments using quantitative reasoning. Courses are intended to give students the capability to reason quantitatively through the examination of important problems and ideas. Students must take a placement exam to determine their proficiency before attempting the mathematics courses that satisfy this requirement. Those who demonstrate basic proficiency must satisfy this requirement with MATH 106. Those who demonstrate a higher proficiency may choose from among an approved set of courses that develop quantitative reasoning.

- Required: MATH 106, or if the student has achieved an appropriate placement score on quantitative skills, one of the following: MATH 108, 110, 111, 113, 115, or 125; or STAT 250. (Students are assumed to have achieved satisfactory completion of the high school math required for admission.)

Information technology goal: Almost no area of academic, professional, or personal life is untouched by the information technology revolution. Success in college and beyond requires computer and information literacies that are flexible enough to change with a changing IT environment and adaptable to new problems and tasks.

The purpose of the information technology requirement is to ensure that students achieve an essential understanding of information technology infrastructure encompassing systems and devices; learn to make the most of the Web and other network resources; protect their digital data and devices; take advantage of latest technologies; and become more sophisticated technology users and consumers.

Courses meeting the “IT only” requirement must address learning outcomes 1 and 2, and one additional outcome. Courses meeting “IT with Ethics component” must address outcomes 1, 2, 3, and 5. Courses meeting the only IT Ethics component must address outcomes 3 and 5.

1. Students will be able to use technology to locate, access, evaluate, and use information, and appropriately cite resources from digital/electronic media.
2. Students will understand the core IT concepts in a range of current and emerging technologies and learn to apply appropriate technologies to a range of tasks.
3. Students will understand many of the key ethical, legal and social issues related to information technology and how to interpret and comply with ethical principles, laws, regulations, and institutional policies.
4. Students will demonstrate the ability to communicate, create, and collaborate effectively using state-of-the-art information technologies in multiple modalities.

5. Students will understand the essential issues related to information security, how to take precautions and use techniques and tools to defend against computer crimes.
   - Required: One approved 3-credit course that meets all IT requirements, or completion of an appropriate combination of courses, proficiency exams, and modules.

Core Requirements

Core requirements help ensure that students become acquainted with the broad range of intellectual domains that contribute to a liberal education. By experiencing subject matter and ways of knowing in a variety of fields, students will be better able to synthesize new knowledge, respond to fresh challenges, and meet the demands of a complex world.

**Literature goal:** Courses aim to achieve a majority of the following learning outcomes: students will be able to read for comprehension, detail, and nuance; identify the specific literary qualities of language as employed in the texts they read; analyze the ways specific literary devices contribute to the meaning of a text; identify and evaluate the contribution of the social, political, historical, and cultural contexts in which a literary text is produced; and evaluate a critical argument in others' writing as well as one's own.
   - Required: One approved course.

**Arts goal:** Courses aim to achieve a majority of the following learning outcomes: students will be able to identify and analyze the formal elements of a particular art form using vocabulary appropriate to that form; demonstrate an understanding of the relationship between artistic technique and the expression of a work's underlying concept; analyze cultural productions using standards appropriate to the form and cultural context; analyze and interpret material or performance culture in its social, historical, and personal contexts; and engage in the artistic process, including conception, creation, and ongoing critical analysis.
   - Required: One approved course.

**Natural science goal:** Courses engage students in scientific exploration; foster their curiosity; enhance their enthusiasm for science; and enable them to apply scientific knowledge and reasoning to personal, professional and public decision-making.
   - Required: Two approved science courses. At least one course will include laboratory experience.

**Western civilization/world history goal:** Courses aim to achieve a majority of the following learning outcomes: students will be able to demonstrate familiarity with the major chronology of Western civilization or world history; demonstrate the ability to narrate and explain long-term changes and continuities in Western civilization or world history; identify, evaluate, and appropriately cite online and print resources; develop multiple historical literacies by analyzing primary sources of various kinds (texts, images, music) and using these sources as evidence to support interpretation of historical events; communicate effectively—through speech, writing, and use of digital media—their understanding of patterns, process, and themes in the history of Western civilization or the world.
   - Required: One approved course.

**Global understanding goal:** Courses aim to achieve a majority of the following learning outcomes: develop understanding of global patterns and processes and their interaction with society; demonstrate understanding of the interconnectedness, difference, and diversity of a global society; identify, evaluate and properly cite resources appropriate to the field, such as audio/visual/online/print materials, or artifacts; apply awareness of global issues to a consideration of individual or collective responsibilities within a global society; and devise analytical, practical, or creative responses to global problems or issues.
   - Required: One approved course.

**Social and behavioral sciences goal:** Courses aim to achieve a majority of the following learning outcomes: Demonstrate understanding of key concepts, terminology, principles or theories within the field; demonstrate understanding of methodological approaches appropriate to the field; identify, evaluate and properly cite resources appropriate to the field, such as audio/visual/online/print materials, or artifacts; explain how individuals, groups or institutions are influenced by contextual...
factors as appropriate to the field; and use appropriate methods to apply social and behavioral science concepts, terminology, principles, or theories to significant issues.

- Required: One approved course.

**Synthesis Requirement**

**Synthesis goal:** The purpose of the synthesis course is to provide students with the opportunity to synthesize the knowledge, skills and values gained from the general education curriculum. Synthesis courses strive to expand students' ability to master new content, think critically, and develop life-long learning skills across the disciplines. While it is not feasible to design courses that cover "all" areas of general education, synthesis courses should function as a careful alignment of disciplinary goals with a range of general education learning outcomes.

A general education synthesis course must address outcomes 1 and 2, and at least one outcome under 3. Upon completing a synthesis course, students will be able to:

1. Communicate effectively in both oral and written forms, applying appropriate rhetorical standards (e.g., audience adaptation, language, argument, organization, evidence, etc.)
2. Using perspectives from two or more disciplines, connect issues in a given field to wider intellectual, community or societal concerns
3. Apply critical thinking skills to:
   a. Evaluate the quality, credibility and limitations of an argument or a solution using appropriate evidence or resources, OR,
   b. Judge the quality or value of an idea, work, or principle based on appropriate analytics and standards

- Required: One approved course.

**Writing-Intensive Course Requirement**

As part of the university’s commitment to student writers in all undergraduate programs, at least one upper-division course in each major has been designated as fulfilling the “writing intensive” (WI) requirement. While other courses in the major may require written projects, teachers of the designated WI courses will devote class time to instruction on how to complete assignments successfully, assign and grade a minimum of 3500 words, provide constructive feedback on drafts, and allow revision of at least one graded assignment. See the description of each major for the specific course or courses that fulfill the WI requirement.

**Approved General Education Courses**

The course list reflects approved courses as of press time. For the most current list, go to provost.gmu.edu/gened/approved-course-listing/

**Foundation Requirements**

**Written communication (6 credits: 3 lower, 3 upper)**

- ENGH 100 - Composition for Non-native Speakers of English Credits: 4 or
• ENGH 101 - Composition Credits: 3
• ENGH 302 - Advanced Composition Credits: 3

Oral communication (3 credits)

• COMM 100 - Public Speaking Credits: 3
  or
• COMM 101 - Interpersonal and Group Interaction Credits: 3

Information technology (all)

• ANTH 395 - Work, Technology, and Society: An IT Perspective Credits: 3
• CDS 130 - Computing for Scientists Credits: 3
• CHEM 350 - Computer Techniques for Chemistry Credits: 3
• CEIE 117 - Information Technology for Engineering Credits: 3
• GOVT 300 - Research Methods and Analysis Credits: 4
• HIST 390 - The Digital Past Credits: 3
• IT 103 - Introduction to Computing Credits: 3
• MUSI 415 - Music in Computer Technology Credits: 3

Information technology (all except ethics)

• AVT 180 - New Media in the Creative Arts Credits: 3
• CS 112 - Introduction to Computer Programming Credits: 4
• PHYS 251 - Introduction to Computer Techniques in Physics Credits: 3

( these must be taken in sequence)
• PSYC 300 - Statistics in Psychology Credits: 4
• PSYC 301 - Research Methods in Psychology Credits: 3
• PSYC 372 - Physiological Psychology Credits: 3
• SOCI 410 - Social Surveys and Attitude and Opinion Measurements Credits: 3

Information technology (ethics only)

• CDS 151 - Data Ethics in an Information Society Credits: 1
• CEIE 409 - Professional Practice and Management in Engineering Credits: 1
• CS 105 - Computer Ethics and Society Credits: 1
- ENGR 107 - Introduction to Engineering Credits: 2
- IT 304 - IT in the Global Economy Credits: 3
- PHIL 112 - Ethics and the Cybersociety Credits: 1

Quantitative reasoning (3 credits)

- MATH 106 - Quantitative Reasoning Credits: 3
- MATH 108 - Introductory Calculus with Business Applications Credits: 3
- MATH 110 - Introductory Probability Credits: 3
- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 115 - Analytic Geometry and Calculus I (Honors) Credits: 4
- MATH 125 - Discrete Mathematics I Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3

Core Requirements

Literature (3 credits)

- ARAB 325 - Major Arab Writers/Stories Credits: 3
- CHIN 310 - Survey of Chinese Literature Credits: 3
- CHIN 311 - Modern Chinese Literature in Translation Credits: 3
- CHIN 325 - Major Chinese Writers Credits: 3
- CHIN 328 - Asian American Women Writers Credits: 3
- CLAS 250 - Classical Mythology Credits: 3
- CLAS 260 - The Legacy of Greece and Rome Credits: 3
- CLAS 340 - Greek and Roman Epic Credits: 3
- CLAS 350 - Greek and Roman Tragedy Credits: 3
- CLAS 360 - Greek and Roman Comedy Credits: 3
- CLAS 380 - Greek and Roman Novels Credits: 3
- ENGH 201 - Reading and Writing about Texts Credits: 3
- ENGH 202 - Texts and Contexts Credits: 3
- ENGH 203 - Western Literary Tradition Credits: 3
- ENGH 204 - Western Literary Traditions Credits: 3
- FREN 325 - Major French Writers Credits: 3
- FREN 329 - Problems of Western Civilization in French Literature Credits: 3
- FRLN 330 - Topics in World Literature Credits: 3
- GERM 325 - Major Writers Credits: 3
- ITAL 325 - Major Italian Writers Credits: 3
- PHIL 253 - Philosophy and Literature Credits: 3
- RELI 235 - Religion and Literature Credits: 3
- RUSS 325 - Major Russian Writers Credits: 3
- RUSS 326 - A Survey of Russian Literature Credits: 3
- RUSS 327 - A Survey of Russian Literature Credits: 3
• SPAN 325 - Major Hispanic Writers Credits: 3

Arts (3 credits)

• ARTH 101 - Introduction to the Visual Arts Credits: 3
• ARTH 102 - Symbols and Stories in Art Credits: 3
• ARTH 103 - Introduction to Architecture Credits: 3
• ARTH 200 - Survey of Western Art Credits: 3
• ARTH 201 - Survey of Western Art Credits: 3
• ARTH 203 - Survey of Asian Art Credits: 3
• ARTH 204 - Survey of Latin American Art Credits: 3
• ARTH 321 - Greek Art and Archaeology Credits: 3
• ARTH 322 - Roman Art and Archaeology Credits: 3
• ARTH 324 - From Alexander the Great to Cleopatra: The Hellenistic World Credits: 3
• ARTH 333 - Early Christian and Byzantine Art Credits: 3
• ARTH 334 - Western Medieval Art Credits: 3
• ARTH 335 - Arts of Medieval England Credits: 3
• ARTH 340 - Early Renaissance Art in Italy, 1300-1500 Credits: 3
• ARTH 341 - Northern Renaissance Art Credits: 3
• ARTH 342 - High Renaissance Art in Italy, 1480–1570 Credits: 3
• ARTH 344 - Baroque Art in Italy, France, and Spain, 1600–1750 Credits: 3
• ARTH 345 - Northern Baroque Art, 1600-1750 Credits: 3
• ARTH 360 - Nineteenth-Century European Art Credits: 3
• ARTH 362 - Twentieth-Century European Art Credits: 3
• ARTH 372 - Studies in 18th- and 19th-Century Art of the United States Credits: 3
• ARTH 373 - Studies in 20th-Century Art of the United States Credits: 3
• ARTH 376 - Twentieth-Century Latin American Art Credits: 3
• AVT 103 - Introduction to the Artist's Studio Credits: 3
• AVT 104 - Studio Fundamentals I Credits: 4
• AVT 215 - Typography Credits: 4
• AVT 222 - Drawing I Credits: 4
• AVT 232 - Painting I Credits: 4
• AVT 243 - Printmaking I Credits: 4
• AVT 252 - Fundamentals of Photography Credits: 4
• AVT 253 - Introduction to Digital Photography Credits: 4
• AVT 262 - Sculpture I Credits: 4
• AVT 272 - Interdisciplinary Arts Credits: 4
• DANC 101 - Dance Appreciation Credits: 3
• DANC 119 - Dance in Popular Culture: Afro-Latino Dance Credits: 3
• DANC 125 - Beginning Modern Dance Credits: 3
• DANC 131 - Beginning Jazz Technique Credits: 3
• DANC 145 - Beginning Ballet Credits: 3
• DANC 161 - Beginning Tap Dance Credits: 3
• DANC 225 - Beginning Intermediate Modern Dance Credits: 3
• DANC 231 - Intermediate Jazz Technique Credits: 3
• DANC 245 - Beginning Intermediate Ballet Credits: 3
• DANC 301 - What is Dance? Credits: 3
• DANC 390 - Dance History I Credits: 3
• DANC 391 - Dance History II Credits: 3
• ENGH 370 - Introduction to Documentary Credits: 3
• ENGH 372 - Introduction to Film Credits: 3
• ENGH 396 - Introduction to Creative Writing Credits: 3
• FAVS 225 - The History of World Cinema Credits: 3
• GAME 101 - Introduction to Game Design Credits: 3
• MUSI 100 - Fundamentals of Music Credits: 3
• MUSI 101 - Introduction to Classical Music Credits: 3
• MUSI 102 - Popular Music in America Credits: 3
• MUSI 107 - The Development of Jazz Credits: 3
• MUSI 301 - Music in Motion Pictures Credits: 3
• MUSI 302 - American Musical Theater Credits: 3
• MUSI 380 - Wind Symphony Credits: 1
• MUSI 381 - University Chorale Credits: 1
• MUSI 382 - Piano Ensemble Credits: 1
• MUSI 383 - Symphonic Band Credits: 1
• MUSI 384 - Symphonic Chorus Credits: 1
• MUSI 385 - Chamber Singers Credits: 1
• MUSI 387 - Symphony Orchestra Credits: 1
• MUSI 389 - Jazz Ensemble Credits: 1
• MUSI 485 - Chamber Ensembles Credits: 1
• PHIL 156 - What Is Art? Credits: 3
• THR 101 - Theatrical Medium Credits: 3
• THR 150 - Drama, Stage, and Society I Credits: 3
• THR 151 - Drama, Stage, and Society II Credits: 3
• THR 210 - Acting I Credits: 3
• THR 230 - Introduction to Technical Theater Credits: 3
• THR 395 - Theater as the Life of the Mind Credits: 3
• THR 411 - Directing on Screen Credits: 3
• THR 412 - Performance on Screen Credits: 3

**Western civilization/world history (3 credits)**

• HIST 100 - History of Western Civilization Credits: 3  
  or  
• HIST 125 - Introduction to World History Credits: 3

**Transfer students can substitute the following courses for HIST 100**

• HIST 101 - Foundations of Western Civilization Credits: 3
• HIST 102 - Development of Western Civilization Credits: 3
• HIST 301 - Classical Greece Credits: 3
- HIST 302 - Classical Rome Credits: 3
- HIST 304 - Western Europe in the Middle Ages Credits: 3
- HIST 305 - The Renaissance Credits: 3
- HIST 306 - The Reformation Credits: 3
- HIST 308 - Nineteenth-Century Europe Credits: 3
- HIST 309 - Europe in Crisis: 1914-1948 Credits: 3
- HIST 314 - History of Germany Credits: 3
- HIST 322 - Modern Britain Credits: 3
- HIST 388 - Topics in European History Credits: 3
- HIST 435 - Society and Culture in Early Modern Europe Credits: 3
- HIST 436 - European Society and Culture: 19th and 20th Centuries Credits: 3
- HIST 480 - Alexander the Great Credits: 3

Transfer students can substitute the following courses for HIST 125

- HIST 202 - Freshman/Sophomore Seminar in Global History Credits: 3
- HIST 387 - Topics in Global History Credits: 3

Social and behavioral science (3 credits)

- AFAM 200 - Introduction to African American Studies Credits: 3
- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
- ANTH 120 - Unearthing the Past: Prehistory, Culture and Evolution Credits: 3
- ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3
- ANTH 396 - Issues in Anthropology: Social Sciences Credits: 3
- CONF 101 - Conflict and Our World Credits: 3
- CONS 410 - Human Dimensions in Conservation Credits: 3
- CRIM 100 - Introduction to Criminal Justice Credits: 3
- ECON 100 - Economics for the Citizen Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3
- ECON 105 - Environmental Economics for the Citizen Credits: 3
- ECON 110 - Introduction to Economic Science Credits: 2
- ECON 111 - Laboratory Methods in Economics Credits: 1 (110 and 111 must be taken in sequence)
- EDUC 372 - Human Development, Learning, and Teaching Credits: 3
- GGS 103 - Human Geography Credits: 3
- GOVT 101 - Democratic Theory and Practice Credits: 3
- GOVT 103 - Introduction to American Government Credits: 3
- GOVT 367 - Money, Markets and Economic Policy Credits: 3
- HEAL 230 - Introduction to Health Behavior Credits: 3
- HIST 121 - Formation of the American Republic Credits: 3
- HIST 122 - Development of Modern America Credits: 3
- LING 306 - General Linguistics Credits: 3
- PSYC 100 - Basic Concepts in Psychology Credits: 3
PSYC 211 - Developmental Psychology Credits: 3
PSYC 231 - Social Psychology Credits: 3
SOCI 101 - Introductory Sociology Credits: 3
SOM 100 - Business in American Society Credits: 3
TOUR 311 - Women and Tourism Credits: 3
WMST 200 - Introduction to Women and Gender Studies Credits: 3

Global understanding (3 credits)

ANTH 302 - Peoples and Cultures of Latin America Credits: 3
ANTH 304 - Peoples and Cultures of the Pacific Credits: 3
ANTH 306 - Peoples and Cultures of Island Asia Credits: 3
ANTH 307 - Ancient Mesoamerica Credits: 3
ANTH 308 - Peoples and Cultures of the Middle East Credits: 3
ANTH 309 - Peoples and Cultures of India Credits: 3
ANTH 311 - Peoples and Cultures of Mainland Southeast Asia Credits: 3
ANTH 312 - Political Anthropology Credits: 3
ANTH 313 - Myth, Magic, and Mind Credits: 3
ANTH 316 - Peoples and Cultures of the Caribbean Credits: 3
ANTH 331 - Refugees Credits: 3
ANTH 332 - Cross-cultural perspectives on globalization Credits: 3
ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
ARTH 319 - Art and Archaeology of the Ancient Near East Credits: 3
ARTH 320 - Art of the Islamic World Credits: 3
ARTH 380 - African Art Credits: 3
ARTH 382 - Arts of India Credits: 3
ARTH 383 - Arts of Southeast Asia Credits: 3
ARTH 384 - Arts of China Credits: 3
ARTH 385 - Arts of Japan Credits: 3
ARTH 386 - The Silk Road Credits: 3
CEIE 100 - Environmental Engineering around the World Credits: 3
COMM 305 - Foundations of Intercultural Communication Credits: 3
COMM 456 - Comparative Mass Media Credits: 3
CRIM 405 - Law and Justice around the World Credits: 3
DANC 118 - World Dance Credits: 3
DANC 318 - Global Perspectives: World Dance Forms Credits: 3
DANC 418 - Global Dance Intensive Credits: 1-3
ECON 360 - Economics of Developing Areas Credits: 3
ECON 361 - Economic Development of Latin America Credits: 3
ECON 362 - African Economic Development Credits: 3
ECON 380 - Economies in Transition Credits: 3
ECON 390 - International Economics Credits: 3
ENGH 362 - Global Voices Credits: 3
ENGH 366 - The Idea of a World Literature Credits: 3
GCH 205 - International Health Credits: 3
GGS 101 - Major World Regions Credits: 3
• GLOA 101 - Introduction to Global Affairs Credits: 3
• GOVT 132 - Introduction to International Politics Credits: 3
• GOVT 133 - Introduction to Comparative Politics Credits: 3
• HIST 130 - History of the Modern Global System Credits: 3
• HIST 251 - Survey of East Asian History Credits: 3
• HIST 252 - Survey of East Asian History Credits: 3
• HIST 261 - Survey of African History Credits: 3
• HIST 262 - Survey of African History Credits: 3
• HIST 271 - Survey of Latin American History Credits: 3
• HIST 272 - Survey of Latin American History Credits: 3
• HIST 281 - Survey of Middle Eastern Civilization Credits: 3
• HIST 282 - Survey of Middle Eastern Civilization Credits: 3
• HIST 328 - Rise of Russia Credits: 3
• HIST 329 - Modern Russia and the Soviet Union Credits: 3
• HIST 356 - Modern Japan Credits: 3
• HIST 358 - Post-1949 China Credits: 3
• HIST 360 - History of South Africa Credits: 3
• HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
• HIST 365 - Conquest and Colonization in Latin America Credits: 3
• HIST 387 - Topics in Global History Credits: 3
• HIST 460 - Modern Iran Credits: 3
• HIST 462 - Women in Islamic Society Credits: 3
• JAPA 310 - Japanese Culture in a Global World Credits: 3
• MSOM 305 - Managing in a Global Economy Credits: 3
• MUSI 103 - Musics of the World Credits: 3
• MUSI 431 - Music History in Society III Credits: 3
• PHIL 243 - Global Environmental Ethics Credits: 3
• PSYC 379 - Applied Cross-Cultural Psychology Credits: 3
• RELI 100 - The Human Religious Experience Credits: 3
• RELI 211 - Religions of the West Credits: 3
• RELI 212 - Religions of Asia Credits: 3
• RELI 313 - Hinduism Credits: 3
• RELI 315 - Buddhism Credits: 3
• RELI 341 - Global Perspectives on Spirituality and Healing Credits: 3
• RELI 374 - Islamic Thought Credits: 3
• RUSS 354 - Contemporary Post-Soviet Life Credits: 3
• SOCI 120 - Globalization and Society Credits: 3
• SOCI 320 - Social Structure and Globalization Credits: 3
• SOCI 332 - The Urban World Credits: 3
• SPAN 322 - Introduction to Latin American Culture Credits: 3
• SYST 100 - Engineering Systems in a Complex World Credits: 3
• THR 359 - World Stages Credits: 3
• TOUR 210 - Global Understanding through Travel and Tourism Credits: 3
• WMST 100 - Representations of Women Credits: 3

Natural science (7 credits total)
Nonlab (3 credits):

- ASTR 103 - Astronomy Credits: 3
- ASTR 302 - Foundations of Cosmological Thought Credits: 3
- CDS 101 - Introduction to Computational and Data Sciences Credits: 3
- CHEM 101 - Introduction to Modern Chemistry Credits: 3
- CHEM 102 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 3
- CHEM 201 - Introductory Chemistry I Credits: 3
- CHEM 202 - Introductory Chemistry II Credits: 3
- CLIM 101 - Global Warming: Weather, Climate, and Society Credits: 3
- EVPP 201 - Environment and You: Issues for the Twenty-First Century Credits: 3
- GEOL 134 - Evolution and Extinction Credits: 3
- GGS 102 - Physical Geography Credits: 3
- UNIV 301 - Great Ideas in Science Credits: 3

Lab (4 credits):

- ASTR 111 - Introductory Astronomy: The Solar System Credits: 3
  and
- ASTR 112 - Introductory Astronomy Lab: The Solar System Credits: 1

- ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3
  and
- ASTR 114 - Introductory Astronomy Lab: Stars, Galaxies, and the Universe Credits: 1

- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 104 - Introductory Biology II Credits: 4
- BIOL 213 - Cell Structure and Function Credits: 4
- CHEM 103 - Chemical Science in a Modern Society Credits: 4
- CHEM 104 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 4
- CHEM 155 - Introduction to Environmental Chemistry I Credits: 4
- CHEM 156 - Introduction to Environmental Chemistry II Credits: 4
- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 251 - General Chemistry for Engineers Credits: 4
- CLIM 111 - Introduction to the Fundamentals of Atmospheric Science Credits: 3
  and
- CLIM 112 - Introduction to the Fundamentals of Atmospheric Science Lab Credits: 1

- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4
- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4
- GGS 121 - Dynamic Atmosphere and Hydrosphere Credits: 4
- PHYS 103 - Physics and Everyday Phenomena I Credits: 4
- PHYS 104 - Physics and Everyday Phenomena II Credits: 4
- PHYS 111 - Introduction to the Fundamentals of Atmospheric Science Credits: 3
  and
- PHYS 112 - Introduction to the Fundamentals of Atmospheric Science Lab Credits: 1
- PHYS 160 - University Physics I Credits: 3
  And
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 243 - College Physics Credits: 3
  and
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
  and
- PHYS 246 - College Physics Lab Credits: 1
- PHYS 260 - University Physics II Credits: 3
  and
- PHYS 261 - University Physics II Laboratory Credits: 1
- PHYS 262 - University Physics III Credits: 3
  and
- PHYS 263 - University Physics III Laboratory Credits: 1

Synthesis requirement

- ANTH 400 - Engaging the World: Anthropological Perspectives Credits: 3
- ARTH 394 - The Museum Credits: 3
- AVT 385 - EcoArt Credits: 4
- AVT 497 - Senior Project Credits: 4
- AVT 498 - Senior Design Project Credits: 4
- BINF 354 - Foundations in Mathematical Biology Credits: 3
- BIOL 301 - Biology and Society Credits: 3
- BIS 490 - Senior Project Credits: 3
- CEIE 490 - Senior Design Project Credits: 3
- COMM 326 - Rhetoric of Social Movements and Political Controversy Credits: 3
- COMM 362 - Argument and Public Policy Credits: 3
- COMM 454 - Free Speech and Ethics Credits: 3
- CONF 490 - Integration Credits: 3
- CONS 490 - Integrated Conservation Strategies Credits: 3
- CRIM 495 - Capstone in Criminology, Law and Society Credits: 3
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
- DANC 490 - Senior Dance Seminar Credits: 3
- ECE 447 - Single-Chip Microcomputers Credits: 4
- ECE 492 - Senior Advanced Design Project I Credits: 1
- ECE 493 - Senior Advanced Design Project II Credits: 2
- ECON 309 - Economic Problems and Public Policies Credits: 3
• EDCI 490 - Student Teaching in Education Credits: 6
• ENGH 305 - Dimensions of Writing and Literature Credits: 6
• EVPP 335 - People, Plants, and Culture Credits: 3
• FAVS 352 - Ethics of Film and Video Credits: 3
• FRLN 385 - Multilingualism, Identity, and Power Credits: 3
• GEOL 420 - Earth Science and Policy Credits: 3
• GGS 303 - Conservation of Resources and Environment Credits: 3
• GGS 304 - Populations Dimensions of Global Change Credits: 3
• GOVT 490 - Synthesis Seminar Credits: 3
• GOVT 491 - Honors Seminar Credits: 3
• HAP 465 - Integration of Professional Skills and Issues Credits: 3
• HIST 300 - Introduction to Historical Method Credits: 3
• HIST 499 - Senior Seminar in History Credits: 3
• IT 492 - Senior Design Project I Credits: 3
• LAS 499 - Research Seminar in Latin American Studies Credits: 3
• MATH 400 - History of Math Credits: 3
• MUSI 490 - Musical Communication in Context Credits: 3
• NCLC 308 - American Landscapes in Fiction, Film, and History Credits: 6
• NURS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3
• PHIL 309 - Bioethics Credits: 3
• PHIL 343 - Topics in Environmental Philosophy Credits: 3
• PHIL 377 - Darwin: Biology and Beyond Credits: 3
• PHIL 378 - Reason, Science and Faith in the Modern Age Credits: 3
• PHIL 379 - Perspectives on Time Credits: 3
• PROV 342 - The George Mason Debates in Current Affairs Credits: 3
• PSYC 405 - Mystery, Madness, and Murder Credits: 3
• PSYC 406 - Psychology of Communication Credits: 3
• PSYC 427 - Community Engagement for Social Change Credits: 3
• RELI 490 - Comparative Study of Religions Credits: 3
• RUSS 353 - Russian Civilization Credits: 3
• SOCI 377 - Art and Society Credits: 3
• SOCI 483 - The Sociology of Higher Education Credits: 3
• SOCW 323 - Human Behavior and the Life Course Credits: 3
• SOM 498 - Capstone Course: Advanced Business Models Credits: 3
• SPAN 388 - Introduction to Latina/o Studies Credits: 3
• SYST 495 - Senior Design Project II Credits: 3
• THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3
• THR 496 - Text in Production Credits: 3
• UNIV 442 - Krasnow Seminar Credits: 3

Total: 40 credits
Transcript Key

Effective 2011 - 2012, George Mason University will publish in its annual catalog a copy of the current transcript key which appears on the reverse side of official transcript paper. The key summarizes policy information pertinent to understanding individual students' transcripts, and may be updated from time to time. The Academic Policies section of this catalog provides policy information in greater detail and is updated annually.

Large Format Here
Key text for the codes and symbols, for the Programs of Study list:

Program Codes

Program codes and symbols have been added to the descriptive information found in college chapters.

■ Degree program or certificate program: Solid square symbol, degree-major code.

▲ Concentration component: Solid triangle symbol, concentration code in parentheses.

Pending program approval notations:

SCHEV: State Council of Higher Education for Virginia
Administration and Faculty

- Board of Visitors
- Administration
- Vice Presidents
- Deans and Directors
- Academic Affairs
- Enrollment Services
- University Libraries
- University Life

- Faculty
  - Faculty Emeriti
  - Instructional and Administrative Faculty 2012-13

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William Scott Willis, BA, MA, PhD, Professor Emeritus of French
Chien-Yun Wu, Associate Professor Emerita of Nursing
Norman A. Yance, BS, BD, ThM, MA Phil, PhD, Associate Professor Emeritus of Religious Studies
George A. Zaphiriou, Professor Emeritus of Law

Instructional and Administrative Faculty 2012 - 13
The faculty list reflects appointments as of March 2012.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Abdalla, Wagida, Physician and Executive Director, Student Health Services. MD 1972, Alexandria University, Egypt; Diplomate of the American Board of Pediatrics, 1982.

Abramson, Alan J., Professor, Department of Public and International Affairs. BA 1976, Wesleyan University; MA 1977, MPhil 1979, PhD 1990, Yale University.

Acs, Zoltan J., University Professor of Public Policy and Director, Center for Entrepreneurship and Public Policy. BA 1972, Cleveland State University; MA 1974, PhD 1980, The New School.

Addleson, Mark S., Associate Professor, School of Public Policy. BA 1972, 1973, Rhodes University; MA 1980, University of Natal, Pietermaritzburg; PhD 1992, University of Witwatersrand.


Aervitz, Irina, Assistant Professor, Global Affairs Program. BA/MA 1998, Novgorod State University; MA 2001, PhD 2007, Miami University of Ohio.

Agnarsson, Geir, Associate Professor of Mathematical Sciences. BS 1990, University of Iceland; PhD 1996, University of California, Berkeley.

Agouris, Peggy, Chair and Professor of Geography and Geoinformation Systems. Director, Center for Earth Observing and Space Research. Dipl Eng 1986, National Technical University of Athens, Greece; MS 1988, PhD 1992, Ohio State University.

Ahn, Changwoo, Associate Professor, Environmental Science and Policy. BS 1992, MS 1996, Seoul National University; PhD 2001, Ohio State University.

Aidoo, Abena, Assistant Professor of Tourism and Events Management, School of Recreation, Health, and Tourism. BA 1997, University of Ghana; MHRD 2002, Clemson University; PhD 2010, University of Delaware.


Aksoy, Pelin A., Assistant Professor of Applied Information Technology. BS 1994, MS 1997, Ankara University, Turkey; PhD 2005, George Mason University.

Albanese, Denise, Professor of English. BA 1978, New York University; PhD 1987, Stanford University.

Albanese, Massimiliano, Assistant Professor, Applied Information Technology. BS, MS 2002, Laurea; PhD 2005, University of Naples “Federico II”.

Aldrich, Margaret, Associate University Registrar for Distributed Campuses. BS 1970, University of Vermont; MEd 1996, George Mason University.

Allbeck, Jan M., Assistant Professor of Computer Science. BS 1995, Bloomsburg University; MS 1997, PhD 2009, University of Pennsylvania.

Allen, Melissa, Core Faculty Member, English Language Institute. BA 1975, MA 1979, San Francisco State University.
Allen, Pamela A., Assistant Dean of Academic and Career Services, School of Management. BS 1972, University of Illinois; MA 1988, Hunter College, City University of New York.

Alligood, Kathleen T., Associate Dean, Honors College; Professor, Mathematical Sciences. BA 1970, George Washington University; MS 1974, PhD 1979, University of Maryland.

Allnutt, Jeremy E., Professor, Electrical and Computer Engineering. BSc 1966, PhD 1970, Salford University.

Almond, Sonya, Term Instructor of Nursing. BSN 2001, Norfolk State University; MSN 2006, George Mason University.

Al-Ubaydli, Omar, Assistant Professor of Economics. BA 2001 University of Cambridge; MA 2003, PhD 2007, University of Chicago.


Ambegaonkar, Jatin, Assistant Professor of Athletic Training, School of Recreation, Health and Tourism. BS 1998, T. N. Medical College, India; MS 2003, Springfield College; PhD 2006, University of North Carolina, Greensboro.


Amireh, Amal, Associate Professor, English. BA 1983, Birzeit University, Palestine; MA 1987, PhD 1997, Boston University.

Ammann, Paul E., Associate Professor, Computer Science. AB 1983, Dartmouth College; MS 1985, PhD 1988, University of Virginia.

Anacker, Katrin B., Assistant Professor of Public Policy, School of Public Policy. MA 1999, MCRP 1999, PhD 2006, Ohio State University.

Anderson, Daniel M., Associate Professor of Mathematical Sciences. BA 1989, St. Olaf College; PhD 1993, Northwestern University.

Anderson, David S., Professor of Education, Graduate School of Education. BS 1971, Duke University; MA 1973, Ohio State University; PhD 1983, Virginia Polytechnic Institute and State University.

Anderson, Dawn, Associate University Registrar for Operations. BBA 1994, Marymount University.


Anderson, Heather, Academic Affairs Coordinator, Honors College. BA 2000, Portland State University; BFA 2004, University of Nevada - Reno; MFA 2007, University of Idaho.

Anderson, Mike, Instructor of Finance. BS 2001, California Polytechnic State University; MS 2003, City University of New York, Baruch College.


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Arciszewski, Tomasz, Professor, Civil, Environmental, and Infrastructure Engineering. BSc 1970, MSc 1970, PhD 1975, Warsaw University of Technology.

Armor, David J., Professor, School of Public Policy. BA 1961, University of California, Berkeley; PhD 1966, Harvard University.

Ascoli, Giorgio A., University Professor, Department of Molecular Neuroscience; Director, Center for Neural Informatics, Structures, and Plasticity. BS 1991, Scuola Normale Superiore, Italy; MS 1993, Pisa University, Italy; PhD 1996, Scuola Normale Superiore.

Asen, Sheryl, Assistant Professor of Education, Graduate School of Education. BS 1974, State University of New York; MS 1977, University of South Carolina; PhD 1997, George Mason University.

Ashcraft, Thomas D., Associate Director and Associate Professor, Art and Visual Technology. BA 1978, University of South Florida; MFA 1982, Indiana University.

Atkins, David C., Director, Johnson Center and Student Union Operations. BS 1990, MA 1998, George Mason University.

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Auffret, Jean-Pierre, Director, MS Technology Management and MS Management of Secure Information Systems. BS 1979, Duke University; MBA 1982, University of Virginia; PhD 1999, American University.

Austin, Clayton, Associate Professor of Theater. BA 1973, Brandeis University; MFA 1986, Yale School of Drama.

Avruch, Kevin Andrew, Henry Hart Rice Professor of Conflict Resolution and Anthropology, School for Conflict Analysis and Resolution. BA 1972, University of Chicago; MA 1973, PhD 1978, University of California, San Diego.

Axtell, Robert, Associate Professor, Department of Computational Social Science, Krasnow Institute for Advanced Study. BS 1983, University of Detroit; PhD 1992, Carnegie Mellon University.


Baghi, Heibatollah, Associate Professor of Global and Community Health. BA 1974, University of Isfahan; MS 1976, PhD 1980, Iowa State University; PhD 1988, Florida State University.

Bai, Chunhong, Assistant Research Associate, Life Science. BS 1987, Peking University; MS 2004, State University of New York, Albany.

Bailey, Charles, Distinguished Professor of Biology. BS 1965, MS 1966, PhD 1968, Oklahoma State University.
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Baker, Ann C., Senior Associate Dean and Professor, School of Public Policy. BS 1966, College of Charleston; MPA 1975, University of Tennessee; PhD 1995, Case Western Reserve University.

Baker, Max A., Executive Director of the Patriot Club. BS 1995, Virginia Polytechnical Institute and State University.

Baker, Pamela, Assistant Professor of Education, Graduate School of Education. BS 1984, MEd 1987, College of William and Mary; EdD 2002, Bowling Green State University.

Baker, Robert, Associate Professor of Sport Management, School of Recreation, Health, and Tourism. BS 1979, MS 1985, Pennsylvania State University; EdS 1986, EdD 1995, College of William and Mary.

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**Bitter-Davis, Doris**, Associate Professor, Psychology. BA 1982, Dickinson College; MA 1984, Hollins College; PhD 1991, American University.

**Blackwell, Kim Avrama**, Professor, Department of Molecular Neuroscience, Krasnow Institute for Advanced Study. BS 1981, Boston University; VMD 1986, MSE 1987, PhD 1988, University of Pennsylvania.

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**Boehm-Davis, Deborah A.**, Associate Dean, College of Humanities and Social Sciences and University Professor of Psychology. AB 1975, Rutgers University; MA 1977, PhD 1980, University of California, Berkeley.

**Boettke, Peter, J.**, University Professor of Economics. BA 1983, Grove City College; PhD 1989, George Mason University.
Boicu, Mihai, Assistant Professor of Applied Information Technology and Associate Director of Learning Agents Center. PhD 2002, George Mason University.

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Bon, Susan C., Associate Professor of Education, Graduate School of Education. BA 1989, University of Toledo; JD 1992, MA 1994, PhD 1996, Ohio State University.

Born, Timothy Lee, Associate Dean of Student and Academic Affairs and Associate Professor of Chemistry. BS 1990, Calvin College; PhD 1996, Mayo Graduate School.

Borne, Kirk, Associate Professor of Computational and Data Sciences. BS 1975, Louisiana State University; MS 1980, PhD 1983, California Institute of Technology

Botan, Carl, Professor, Communication. BA 1972, Western Michigan University; MA 1982, PhD 1985, Wayne State University.

Bottoms, D. Michael, Assistant Professor, History and Art History. BA 1993, University of California, Berkley; MA 1998, PhD 2005, University of California, Los Angeles.

Boudinot, Patricia, Instructor, Geography. BS 1976, MS 1978, University of Nice.

Boudreaux, Donald J., Professor, Economics. BA 1980, Nicholls State University; MA 1982, New York University; PhD 1986, Auburn University; JD 1992, University of Virginia.

Bousel, Paul, Assistant Director, Academic Advising Center. BA 1975, Hofstra University; MA 1977, George Washington University.

Bowden, Paul C., Associate Athletic Director of Compliance, Intercollegiate Athletics. BA 1991, Hampton University.

Bowdoin, Jessica, Head, Interlibrary Loan and Document Delivery. BA 1996, College of William and Mary; MLIS 1999, University of Illinois, Urbana-Champaign.

Boybeyi, Zafer, Associate Professor, Atmospheric, Oceanic and Earth Sciences. BS 1984, Istanbul Technical University; MS 1990, San Jose State University; PhD 1993, North Carolina State University.

Boyd, Jan, Assistant Dean, Academic Outreach, College of Health and Human Services. BSN 1975, Marquette University; MSN 1985, Northern Illinois University; PhD 2011, George Mason University.

Bradshaw, Duane D., Director for Career Development and Alumni Relations, School of Public Policy. BA 1996, MEd 1998, Clemson University.

Brayley, Russell, Professor of Tourism and Events Management, School of Recreation, Health and Tourism. BS 1977, MA 1986, Brigham Young University; PhD 1990, Texas A&M University.

Brazer, David S., Associate Professor of Education, Graduate School of Education. AB 1979, University of Michigan; ME 1986, PhD 1988, Stanford University.

Breglia, Lisa, Assistant Director of Global Affairs Program, Term Assistant Professor of Global Affairs. BA 1994, MA 1996, University of Florida; PhD 2003, Rice University.

Brigham, Frederick, Associate Professor of Education, Graduate School of Education. BS 1977, MEd 1983, Bowling Green State University; PhD 1992, Purdue University.

Bristol, Joan C., Associate Professor, History and Art History. BA 1990, Bryn Mawr College; MA 1994, San Francisco State University; PhD 2001, University of Pennsylvania.

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Brock, Elizabeth A., Associate Vice President and Controller, Fiscal Services. MA 1992, Georgetown University.

Broderick, Marc, Vice President for University Development and Alumni Affairs. BA 1993, George Washington University.

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Brouse, Peggy S., Associate Professor, Systems Engineering and Operations Research. BS 1978, American University; MBA 1986, Marymount University; PhD 1992, George Mason University.

Brown, Andrew R., Director of Communications and Marketing, School of Public Policy. BA 1999, Lycoming College; MFA 2002, George Mason University.

Brown, Elizabeth Levine, Assistant Professor of Education, Graduate School of Education. BA 2001, Colgate University; MAT 2004, American University; MA 2007, Washington College; PhD 2011, University of Pittsburgh.

Brown, Gil, Chief Budget Officer, Office of Budget and Planning.

Brown III, William Thomas, Instructor; Baseball Coach; and Assistant Manager, Recreation Sports Complex. BA 1980, George Mason University.

Brozo, William, Professor of Education, Graduate School of Education. BA 1977, University of North Carolina; MEd 1979, PhD 1982, University of South Carolina.

Bruno, Irene, Term Associate Professor, Applied Information Technology. BS 1994, University of Pittsburgh; MEd 1991, Pennsylvania State University; PhD 2003, Capella University.

Buchanan, Phillip G., Associate Professor of Accounting. BS 1970, Susquehanna University; MS 1973, Pennsylvania State University; PhD 1982, Temple University; CPA, New York and Pennsylvania.

Buchy, Jackie, Assistant Dean, Graduate Enrollment, School of Management. BBA 2004, James Madison University; MPS 2010, Georgetown University.

Buehl, Michelle, Associate Professor of Education, Graduate School of Education. BA 1997, Hollins College; MA 2002, PhD 2003, University of Maryland.

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Burnham, Philip, Term Assistant Professor of English. BA, Beloit College; MFA, University of Massachusetts; PhD 1987, University of New Mexico.

Burns, M. Susan, Associate Professor of Education, Graduate School of Education. BS 1974, Pennsylvania State University; MA 1980, PhD 1983, Vanderbilt University.

Burr, Zofia A., Dean, Honors College; Associate Professor, English. BA 1982, Sonoma State University; MFA 1987, MA 1990, PhD 1992, Cornell University.
**Burroughs, James N.**, Term Assistant Professor, Department of Public and International Affairs. BS 1977, James Madison University; JD 1981, College of William and Mary; MPA 1994, George Mason University.

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**Butler, Ann B.**, Professor of Molecular Neuroscience, Krasnow Institute for Advanced Study. BA 1967, Oberlin College; PhD 1971, Case Western Reserve University.

**Butler, Douthard R.**, Associate Athletic Director for Academics, Intercollegiate Athletics. BS 1995, Prairie View A&M University; MA 1976, Central Michigan University; PhD 1992, George Mason University.

**Butler, Lawrence E.**, Associate Professor of Art History. BA 1978, MA 1980, Oberlin College; PhD 1989, University of Pennsylvania.

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**C**

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**Callhoun, Thomas G.**, Vice President, Facilities. BE 1978, Vanderbilt University; MS 1987, Stanford University.

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**Camphouse, Mark D.**, Associate Director for Personnel, School of Music and Professor of Music. BM 1975, MM 1976 Northwestern University.

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Carbonneau, Suzanne, Professor of Art and Visual Technology, College of Visual and Performing Arts. BA 1976, Bates College; MA 1978, American University; CMA 1979, Laban Institute of Movement Studies; PhD 1990, New York University.

Carisi, Kimberly, Term Assistant Professor of Forensics. BS 2001 James Madison University, MFS 2003, George Washington University.

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Caswell, Amanda, Assistant Professor of Athletic Training, School of Recreation, Health, and Tourism. BS 1994, Ashland University; MS 1995, California University of Pennsylvania; PhD 2004, Ohio University.

Caswell, Shane, Associate Professor of Athletic Training, School of Recreation, Health, and Tourism. BS 1999, State University of New York, Brockport; MS 2000, PhD 2003, Ohio University.

Cattaneo, Lauren, Associate Professor of Psychology. BA 1992, University of Michigan, Ann Arbor; MA 1997, PhD 2001, University of Maryland, College Park.
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Censer, Jack Richard, Professor of History and Dean, College of Humanities and Social Sciences. AB 1968, Duke University; MA 1971, PhD 1973, Johns Hopkins University.

Censer, Jane Turner, Professor of History. BA 1973, Transylvania University; MA 1975, PhD 1980, Johns Hopkins University.

Cervone, Guido, Assistant Professor, Geography and Geoinformation Science. BS 1998, Catholic University; MS 2000, PhD 2004, George Mason University.

Chandhoke, Vikas, Professor of Biology and Dean, College of Science. BPharm 1986, MDSc 1986, Birla Institute of Technology and Science; PhD 1991, University of Maine.


Chang, Michael G., Associate Professor, History and Art History. AB 1992, Princeton University; PhD 2001, University of California, San Diego.

Chang, Shih-Chun, Associate Professor, Electrical and Computer Engineering. BS 1970, National Cheng Kung University; PhD 1977, University of Hawaii.

Chang, Yoonmee, Associate Professor, English. BA 1992, Tufts University; PhD 2003, University of Pennsylvania.

Chao, Frederick S., Head Coach Men’s Volleyball, Intercollegiate Athletics. BA 1994, George Mason University.

Chazen-Cohen, Rachel, Associate Professor of Psychology. BA 1988, University of Pennsylvania; MA 1994, Tufts University; PhD 1997, Yale University.


Chen, Jim X., Professor, Computer Science. BS 1983, MS 1986, Southwest Jiaotong University; PhD 1995, University of Central Florida.

Chen, Jimmy, Digital Library Developer, MS 2000, Harbin Institution of Technology, China; MS 2009, University of Illinois at Urbana-Champaign.

Chen, Long, Assistant Professor of Accounting. BS 2000, Beijing Technology and Business University; MS 2005, PhD 2008, Washington University, St. Louis.

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Christensen, Julie A., Chair, Modern and Classical Languages; Associate Professor of Russian. BA 1970, University of Iowa; MA 1972, PhD 1978, University of California, Berkeley.

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Webster, Dennis Wayne, Adjunct Faculty, Higher Education Program. BA 1974, Seton Hall University; MA 1977, PhD 1982, University of Maryland.

Wechsler, Harry, Professor, Computer Science. BS 1971, Tel Aviv University, Israel; MS 1973, Weizmann Institute of Science, Israel; PhD 1975, University of California, Irvine.

Wedel, Janine R., University Professor, School of Public Policy. BA 1978, Bethel College; MA 1980, Indiana University; PhD 1985, University of California, Berkeley.

Weeks, Andrea, Assistant Professor, Environmental Science and Policy. BS 1997, Cornell University; PhD 2003, University of Texas, Austin.

Wegman, Edward J., Bernard J. Dunn Professor of Information Technology and Applied Statistics. BS 1965, St. Louis University; MS, PhD 1968, University of Iowa.

Weigel, Robert S., Assistant Professor of Physics. BS 1995, University of Wisconsin, Platteville; MS 1997, University of Illinois, Urbana-Champaign; PhD 2000, University of Texas, Austin.

Weinberger, Steven H., Associate Professor of English. BA 1978, University of Pittsburgh; PhD 1988, University of Washington.

Weingartner, Joseph C., Associate Professor, Physics and Astronomy. BS 1994, State University of New York, Stony Brook; MA 1996, PhD 1999, Princeton University.

Weinstein, Ali A., Assistant Professor of Rehabilitation Science, Deputy Director, Center for the Study of Chronic Illness and Disability. BS 1999, Lafayette College; MA 2001, University of Maryland; MS 2004, PhD 2007, Uniformed Services University of the Health Sciences.

Weisburd, David L., Distinguished Professor, Criminology, Law and Society. BA 1976, Brandeis University; MA 1978, PhD 1985, Yale University.

Weisman, David Schor, Affiliate Associate Professor of Psychology. BA 1971, American University; MA 1973, Fairleigh Dickinson University; EdD 1979, Catholic University of America.

Weiss, Margaret, Assistant Professor of Education, Graduate School of Education. BA 1988, MEd 1992, PhD 1999, University of Virginia.

Westcoat-Andes, Martha, Associate Dean for Administration, College of Science. BA 1975, Smith College, MBA 1985, Columbia University

Wheeler, Kathy D., Executive Director, Community Resource Center, Mason Enterprise Center. BA 1991, George Mason University; MBA 1994, Troy State University.

Wheelock, Stefan M., Assistant Professor of English. BA 1993, Tougaloo College; PhD 2001, Brown University.
Whildin, William, Term Associate Professor of Forensics, BS 1978, George Mason University; MS 1989, Indiana State University.

White, C. Stephen, Associate Dean and Professor of Education, College of Education and Human Development. BA 1974, Coe College; MA 1978, University of Minnesota; PhD 1985, Texas A&M University.

White, Elizabeth L., Associate Professor, Computer Science. BS 1985, MS 1986, College of William and Mary; PhD 1994, University of Maryland.

White, Gail Scott, Associate Professor of Art and Visual Technology. BA 1978, Virginia Polytechnic Institute and State University; MFA 1983, Tufts University.


Whittington, Frank J., Senior Associate Dean for Academic Affairs, College of Health and Human Services; Professor of Gerontology, Department of Global and Community Health. BA 1968, Mississippi State University; MA 1971, PhD 1975, Duke University.


Wiest, Philip Ray, Associate Professor of Economics. BA 1966, Franklin and Marshall College; MS 1967, Lehigh University; PhD 1976, University of Pittsburgh.

Wiggins, Brenda, Associate Professor of Parks, Recreation, and Leisure Studies, School of Recreation, Health, and Tourism. AB 1975, San Diego State University; MA 1981, University of Maryland; PhD 1994, University of Oregon.

Wiggins, David, Professor of Physical Education, School of Recreation, Health, and Tourism. AB 1974, MA 1975, San Diego State University; PhD 1979, University of Maryland.

Wijesekera, Duminda, Associate Professor, Computer Science. BSc 1981, University of Colombo; MS 1989, PhD 1990, Cornell University; MS 1995, PhD 1997, University of Minnesota.

Wiley, Harolyn, Early Childhood and Special Education Specialist. BS 1979, Appalachian State University; MA 1984, Gallaudet University; PhD 1991, University of Illinois.

Willett, James D., Professor and Chair, School of Systems Biology. AB 1959, University of California, Berkeley; PhD 1965, Massachusetts Institute of Technology.


Williams, Herbertia, Equal Opportunity Specialist. BA 1991, University of Virginia; JD 1994, George Mason University School of Law.

Williams, Joseph, Assistant Professor of Education, Graduate School of Education. BS 2005, MS 2007, Minnesota State University; PhD 2011, University of Iowa.

Williams, Shannon E., Assistant Director, PhD Student Services, School of Public Policy. BS 1997, University of Vermont; MS 2004, George Mason University.

Williams, Walter E., John M. Olin Distinguished Professor of Economics; BA 1965, California State University; MA 1966, PhD 1972, University of California, Los Angeles.

Williams van Rooij, Shahron, Assistant Professor of Education, Graduate School of Education. BA 1968, City College New York; MA 1970, American University of Beirut; PhD 1980, City University of New York Graduate Center; PhD 2007, George Mason University.
Willis, Boris, Assistant Professor of Computer Game Design. BFA 2003, George Mason University; MFA 2007, Ohio State University.

Willis, James J., Assistant Professor, Criminology, Law and Society. BA 1991, Pennsylvania State University; PhD 2000, Yale University.

Willis, Odette P., Assistant Professor of Nursing. BSN 1973, Texas Woman's University; MN 1981, University of California, Los Angeles; MBA 1996, Golden Gate University.

Wilsford, David, Professor of Government and Politics. BA 1977, University of South Carolina; MA 1984, PhD 1987, University of California, San Diego.

Wilson, David B., Chair and Professor, Criminology, Law, and Society. BA 1983, Whitworth College; MA 1987, University of Nevada, Las Vegas; PhD 1995, Claremont Graduate School.

Wilson, Deborah J., Associate Athletic Director, Academic Services and Sports Psychologist. BS 1971, James Madison University; MA 1973, Ohio State University; PhD 1986, University of Maryland.

Wilson, Rhett, Assistant Dean, Development, School of Management. BS 2004, Arizona State University.

Wiltse, Cathy A., Associate Director, Virginia Small Business Development Center Network. BA 1986, Ursuline College; MPA 2003, George Mason University.

Winant, Peter, Assistant Professor and Associate Director of Art and Visual Technology, College of Visual and Performing Arts. BS 1974, Skidmore College; MFA 1980, Indiana University.

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Winkert, Catherine A., Budget Manager, Finance and Administration, College of Visual and Performing Arts. BA 1987, Marymount University.

Winkler, Martin M., University Professor of Classics. MA 1977, West Virginia University; PhD 1982, University of Southern California.

Winsler, Adam, Professor of Psychology. BA 1988, University of New Mexico; PhD 1994, Stanford University.

Winter, Patrice M., Term Instructor of Rehabilitation Science and Center for the Study of Chronic Illness and Disability. BS 1976, Virginia Commonwealth University; MS 1982, Institute of Graduate Health Science.

Witte, James C., Professor of Sociology and Anthropology and Director, Center for Social Science Research. BA 1979, Beloit College; MPA 1991, University of Wisconsin-Madison; PhD 1991, Harvard University.

Woitek, Kira M., Director of Annual Giving, Development Office. BS 1992, Babson College; MA 1999, Georgetown University.

Wojtusiak, Janusz, Assistant Professor of Health Administration and Policy. MS 2001, Jagiellonian University; PhD 2008, George Mason University.

Wolf, Paige P., Associate Professor, Management. BA 1992, University of Delaware; MS 1994, PhD 1996, Virginia Polytechnic Institute and State University.

Wolf-Branigin, Michael, Associate Professor of Social Work. BA 1976, Western Michigan University; 1978, Stockholms Universitet; MSW 1979, University of Michigan; PhD 1999, Wayne State University.

Wolfe, Cathy M., Director, Campus Planning, Facilities. BS, MA 1985, State University of New York Buffalo; MS 2000, Drexel University.
Wolfe, James W., Entrepreneur in Residence and Assistant Professor of Management. BS 1977, MBA 1979, JD 1981, Indiana University.

Wong, David, Professor of Geography and Geoinformation Science. Honour Diploma 1984, Hong Kong Baptist College; MA 1985, PhD 1990, State University of New York, Buffalo.

Wong, Shelley, Associate Professor of Education, Graduate School of Education. BA 1971, University of California, Santa Cruz; MA 1986, University of California, Los Angeles; EdD 1990, Columbia University.

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Woody, Beverly, Assistant Professor of Education, Graduate School of Education. BS 1969, Virginia State University; MEd 1977, University of Virginia; EdD 1993, Vanderbilt University.

Wrbican, Sue, Assistant Professor of Art and Visual Technology. BA 1993, University of Pittsburgh; MFA 1996, Rhode Island School of Design.

Wren, William Christopher, Term Assistant Professor of Computer Game Design, College of Visual and Performing Arts. BA 1996, University of San Francisco.

Wright, Catherine. Term Professor, Communication. BS 1992, Phillips University; MA 1994, Texas Tech University; PhD 2005, Regent University.

Wright, Heather, Assistant Director for Career Development, School of Public Policy. BA 2003, University of South Carolina; MA 2009, Marymount University.

Wrigley, Barbara, Executive Director, Women’s Business Center. BA 1976, Hope College; MS 1987, American University.

Wu, Yuntao, Associate Professor, Molecular and Microbiology and Life Science. BS 1985, Wuhan University; MS 1988, Chinese Academy of Sciences; PhD 1998, Queen’s University.

Wulf, Douglas John, Associate Professor of English. BA 1988, Northwestern University; MA 1993, Wright State University; PhD 2000, University of Washington.

Wulfkohle, Julia D., Research Professor, Center for Applied Proteomics and Molecular Medicine. BA 1989, Grinnell College; PhD 1996, Purdue University.

Wuttke, Brian, Associate Professor of Music. MM 2007, University of Miami; PhD 2011, University of Miami.

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X

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Y

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Yang, Y. Tony, Assistant Professor of Health Administration and Policy. ScD 2006, Harvard University.

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Z

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Zagarri, Rosemarie, Professor of History. BA 1977, Northwestern University; MA 1978, M.Phil 1980, PhD 1984, Yale University.

Zamon, Mary E., Associate Director of Institutional Assessment. MAT 1983, Webster University; MSFS 1967, Georgetown University; PhD 2009, George Mason University.

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Zenkov, Kristien, Associate Professor of Education, Graduate School of Education. BA 1989, University of Notre Dame; MEd 1993, University of Illinois, Chicago; PhD 2000, University of Wisconsin, Madison.

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Zhou, Quiping (Pearl), Assistant Professor of Nursing. Diploma in Nursing 1980, Zong Hou Nursing College; MSN 1994, University of Alberta; PhD 2001, University of Maryland.
Zhou, Ying, Director, Institutional Assessment. BA 1996, Beijing Foreign Studies University; MEd, PhD 2003, Pennsylvania State University.

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Zimmerman, Rick, Professor and Chair, Global and Community Health. BA 1978, Stanford University; MS 1981, PhD 1983, University of Wisconsin.

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Zobel, Julie A., Director, Office of Lab Safety. BS 1994, University of Findlay; BS 1996, MS 1998, University of Akron; PhD 2010, George Mason University.

Zolnik, Edmund J., Assistant Professor, School of Public Policy. BS 1985, Fairfield University; MA 2000, PhD 2004, University of Connecticut.

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School for Conflict Analysis and Resolution

School for Conflict Analysis and Resolution

Phone: 703-993-1300
Web: scar.gmu.edu
College Code: CA

Administration

Andrea Bartoli, Dean
Julie Shedd, Associate Dean for Administration
Sandra Cheldelin, PHD Program Director
Daniel Rothbart, MS Program Director
Mara Schoeny, Graduate Certificate Program Director
Agnieszka Paczynska, Undergraduate Program Director

Faculty

Professors: Avruch, Bartoli, Cheldelin, Gopin, Hirsch, Jeong, Rothbart, Rubenstein, Sandole, Sluzki

Associate professors: Cobb, Goodale, Korostelina, Lyons, Paczynska

Assistant professors: Dwyer, Flores, Maulden, Nan, Schoeny, Simmons

Research professors: Price, Sluzki

Affiliate faculty: Cioffi-Revilla, Dale, Diamond, Dukes, Geller, Hamrin, Johnston, Montville, Murdock, Oren, Osman, Paden, Pirio, Pruitt, Stanton

Emeritus faculty: Mitchell

Course Work

The School for Conflict Analysis and Resolution (S-CAR) offers all course work designated CONF in the Courses chapter of this catalog.

Undergraduate Programs

Phone: 703-993-4165
E-mail: ugradcar@gmu.edu
Location: Fairfax Campus

Agnieszka Paczynska, Undergraduate Program Director.
Conflict Analysis and Resolution (CAR) offers students a BA, a BS, or a minor in a growing interdisciplinary social science field with practical applications. Conflict analysis and resolution is committed to analyzing the sources and dynamics of conflict and the means for resolution toward lasting peace. All CAR students take a series of core courses that provide a background in conflict theory, analysis, and conflict resolution skills. Required bridge courses cover conflict analysis and resolution at three levels: interpersonal conflict, community and organizational conflict, and international conflict. After selecting a level of conflict as a concentration, students choose courses from units throughout the university that relate to the concentration and their areas of interest, such as anthropology, communication, government, philosophy, psychology, management, sociology, and New Century College. The major also requires 3 credits of field experience in the form of an internship, a service-learning opportunity, or study abroad.

Graduate Programs

Phone: 703-993-1300
E-mail: scarinfo@gmu.edu
Location: Arlington Campus

Sandra Cheldelin, PHD Program Director
Daniel Rothbart, MS Program Director

The PhD program in Conflict Analysis and Resolution, the first of its kind in the United States, provides advanced study for students in the fields of conflict and conflict resolution. Students are prepared for careers as researchers, theoreticians, and teachers in higher education, and as policy administrators, analysts, and consultants in the public and the private sectors. The program stresses a close link between knowledge of theory and process in the resolution of conflict. For this, training in the methods of research and analysis is emphasized. In addition, students are expected to obtain a background in a substantive area of conflict, usually related to the topic of the dissertation.

The MS in Conflict Analysis and Resolution is a two-year professional program that prepares students for practice and further academic work by integrating conflict analysis and resolution theory, research, and practical techniques. Participants study the theory, methods, and ethical perspectives of the field, and apply this knowledge in laboratory simulations and workshops, internships, and field practice. Graduates work in a variety of settings where conflict resolution is useful and interest groups are in conflict with current and emergent public policy. Examples are businesses, unions, government agencies, religious groups, court systems, educational institutions, community centers, international relief and development organizations, and consulting firms.

Graduate Certificates

Phone: 703-993-1300
E-mail: icarcert@gmu.edu
Location: Arlington Campus

Mara Schoeny, Certificate Program Director

Five graduate certificate programs are administered by S-CAR. Each of these one-year, 15-credit programs is specifically tailored to provide students with practical knowledge of conflict analysis and resolution relevant to their focused areas of work. Designed for mid-career professionals studying in a cohort environment, the certificate programs integrate conflict analysis and resolution theory, research, and practical technique. These programs use intensive course sessions, lecture, seminar, and applied mentored learning in real and simulated situations to prepare students to use conflict analysis and resolution approaches in their work in a variety of fields.

Academic Policies
Students should become familiar with the university's general academic policies in addition to those specific to each academic unit. Please see the Academic Policies section of this catalog.

Transfer Students

Admitted and enrolled transfer students who have completed an AA, AS, or AA&S degree from the Virginia Community College System (VCCS) and have been offered admission to Mason by the Office of Admissions may be eligible for a waiver of all George Mason University's lower level general education requirements in accordance with the Guaranteed Admission Agreement. Students eligible for this waiver are still required by the university to complete English 302 and a synthesis course.

Transfer students who have been offered admission under the terms of the Guaranteed Admission Agreement and are pursuing a BA are considered to have met all school requirements except for proficiency in a foreign language. Transfer students who have been offered admission under the terms of the Guaranteed Admission Agreement and are pursuing a BS are considered to have met the school requirement of Non-Western Culture; the additional requirements for the BS will be met only if the student transfers in a direct equivalent course.

Students with a bachelor's degree from an accredited institution who are pursuing a BA in this school are considered to have met all school requirements except for proficiency in a foreign language. Students with a bachelor's degree from an accredited institution who are pursuing a BS in this school are considered to have met the school requirement of Non-Western Culture; the additional requirements for the BS will be met only if the student transfers in a direct equivalent course.

Appeal of Decisions

The policies of the School for Conflict Analysis and Resolution are designed to be consistent, equitable, and transparent. Our office strives to be thorough, timely, and open to answer any questions students may have regarding our decisions and/or the process through which they were reached. Students seeking clarification and explanation of the decision should request an appointment with the S-CAR Program Director to discuss their concerns.

Students have the right to appeal decisions regarding requests for academic actions. This step can only be taken after a request to meet with the Program Director. Students who wish to pursue an appeal after this meeting should do so only if they can provide sufficient and compelling reasons for their initial claim to be reconsidered. Such reasons include newly available documentation, proof of an irregularity in procedures, proof of inequity or inconsistency, or consequences so serious that further review is warranted. A student's dissatisfaction or disagreement with the decision does not constitute sufficient reason for a decision to be changed. Appeals are first reviewed by the Program Director. If denied, the appeal is forwarded to the S-CAR Dean. The decision of the S-CAR Dean is the final decision of the School.

If the appeal is a case involving a school-level policy, the Dean serves as the final point of appeal. If the appeal involves university level policies, students must first complete the school-level appeal process before appealing to the Provost's Office.

Undergraduate Degree

Conflict Analysis and Resolution, BA

Banner Code: CA-BA-CONF

Students must fulfill all requirements for bachelor's degrees as stated in Academic Policies including all University General Education requirements. Students majoring in S-CAR must also complete the college-level requirements for philosophy or religious studies, foreign language proficiency, social sciences, and non-Western culture as well as 42 major requirement credits for the BA degree.
Students pursuing a double major/degree with a program outside of the S-CAR undergraduate program will be expected to fulfill all of the university general education and college requirements necessary to complete the second major. Please check with the second major department concerning additional requirements.

Writing-Intensive Requirement

All Mason students are required to complete at least one course designated as “writing intensive” in their major at the 300-level or above. CONF 302 has been designated “writing intensive.”

Advising

S-CAR advisors help students create interdisciplinary programs that meet their interests and career goals. All majors and minors are strongly encouraged to meet regularly with an S-CAR academic advisor who will help students develop and follow a coherent plan of study and complete the degree in a timely manner.

Physical Education Courses

PHED courses offered by the School of Recreation, Health, and Tourism that are activity courses cannot be counted toward credits required for a degree in S-CAR. Students may use nonactivity PHED courses for elective credit for S-CAR degrees.

Degree Requirements

Required core courses (18 credits):

- CONF 101 - Conflict and Our World Credits: 3
- CONF 210 - Theories of Conflict Analysis and Resolution Credits: 3
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
- CONF 301 - Research and Inquiry in Conflict Resolution Credits: 3
- CONF 302 - Culture, Identity, and Conflict Credits: 3
- CONF 490 - Integration Credits: 3

Required bridge courses (9 credits):

- CONF 320 - Interpersonal Conflict Analysis and Resolution Credits: 3
- CONF 330 - Community, Group, and Organizational Conflict Analysis and Resolution Credits: 3
- CONF 340 - Global Conflict Analysis and Resolution Credits: 3

Field experience (3 credits):

Students can choose to fulfill this requirement through an internship, service learning, or study abroad. Please contact an S-CAR advisor for information on the opportunities/procedures for field experience credit. Students interested in study abroad should consult the Center for Global Education. More information can be found at globaled.gmu.edu. Prior approval by the
major advisor is required for all field experience options. Other options may be available. Please check with the S-CAR advising office with questions.

**Internship/Service Learning:**

- CONF 370 - Internship Field Experience Credits: 1-9

**Study Abroad:**

- CONF 385 - International Field Experience Credits: 3

**Concentration courses (12 credits):**

Students choose courses from one of three levels of conflict: interpersonal (micro level), community and organizational (mezzo level), and international (macro level). Students should choose classes that pertain to their concentration and are listed as approved. Students are encouraged to check special topics courses each semester and think creatively about the applicability of courses that support learning in their chosen concentration. Independent study approved by the advisor is also an option. The S-CAR director will consider student requests for approval of courses not listed below.

▲ **Concentration in Interpersonal Conflict (MICR)**

Students choose four courses from the following areas:

- ANTH 315 - Socialization Processes: Family, Childhood, Personality in Cross-Cultural Perspective Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 371 - Psychological Anthropology Credits: 3
- COMM 301 - Foundations of Interpersonal Communication Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- COMM 401 - Interpersonal Communication in the Workplace Credits: 3
- COMM 434 - Interviewing Credits: 3
- COMM 465 - Topics in Communication and Gender Credits: 3
- CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
- CONF 325 - Dialogue and Difference Credits: 3
- CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
- CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
- CRIM 302 - Delinquency Credits: 3
- CRIM 307 - Social Inequality, Crime, and Justice Credits: 3
- CRIM 404 - Crime Victims and Victimization Credits: 3
- CRIM 406 - Family Law and the Justice System Credits: 3
- FRLN 380 - Topics in the Sociopolitics of Language Credits: 3
- FRLN 385 - Multilingualism, Identity, and Power Credits: 3
- GOVT 355 - Public Personnel Administration Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 310 - Violence and Gender Credits: 3-6
- NCLC 314 - Conflict, Trauma and Healing Credits: 6
- NCLC 315 - Spirituality and Conflict Transformation Credits: 6
- NCLC 317 - Issues in Family Relationships Credits: 4
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
- NCLC 331 - The Nonprofit Sector Credits: 4
- NCLC 334 - Environmental Justice Credits: 4
- NCLC 335 - Ethics, Communication, and Freedom Credits: 3-6
- PHIL 309 - Bioethics Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 313 - Child Psychology Credits: 3
- PSYC 314 - Adolescent Psychology Credits: 3
- PSYC 321 - Counseling Psychology Credits: 3
- PSYC 324 - Personality Theory Credits: 3
- PSYC 379 - Applied Cross-Cultural Psychology Credits: 3
- PSYC 466 - Psychology of Intimate Relationships Credits: 3
- PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3
- RELI 360 - Religion and Politics Credits: 3
- SOCI 300 - Social Control and Freedom Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
- SOCW 301 - Laboratory in Interpersonal Communication Credits: 4
- SOCW 323 - Human Behavior and the Life Course Credits: 3
- WMST 301 - Sex and Gender in Contemporary Society Credits: 3

▲ Concentration in Community and Organizational Conflict (MEZZ)

Students choose four courses from the following areas:

- ANTH 301 - Native North Americans Credits: 3
- ANTH 310 - Social Organization and Kinship Credits: 3
- ANTH 340 - Comparative Perspectives on Immigration Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 488 - Gender, Sexuality, and Culture Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- COMM 326 - Rhetoric of Social Movements and Political Controversy Credits: 3
- COMM 335 - Organizational Communication Credits: 3
- COMM 350 - Mass Communication and Public Policy Credits: 3
- COMM 432 - Political Communication Credits: 3
- COMM 434 - Interviewing Credits: 3
- CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
- CONF 325 - Dialogue and Difference Credits: 3
- CONF 345 - Social Dynamics of Terrorism, Security, and Justice Credits: 3
- CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
- CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
- CRIM 302 - Delinquency Credits: 3
- CRIM 306 - Criminal Justice Ethics Credits: 3
- CRIM 406 - Family Law and the Justice System Credits: 3
- CRIM 407 - Advanced Topics in Law and Society Credits: 3
- CRIM 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
- ECON 309 - Economic Problems and Public Policies Credits: 3
- ECON 320 - Labor Problems Credits: 3
- GGS 306 - Urban Geography Credits: 3
- GGS 406 - Suburban Geography Credits: 3
- GOVT 301 - Public Law and the Judicial Process Credits: 3
- GOVT 309 - Government and Politics of Metropolitan Areas Credits: 3
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 355 - Public Personnel Administration Credits: 3
- GOVT 365 - State and Regional Public Policy Credits: 3
- GOVT 414 - Politics of Race and Gender Credits: 3
- GOVT 460 - Surveillance and Privacy in Contemporary Society Credits: 3
- HIST 350 - U.S. Women's History Credits: 3
- MSOM 301 - Managing People and Organizations Credits: 3
- NCLC 304 - Social Movements and Community Activism Credits: 4
- NCLC 310 - Violence and Gender Credits: 3-6
- NCLC 314 - Conflict, Trauma and Healing Credits: 6
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
- NCLC 334 - Environmental Justice Credits: 4
- NCLC 335 - Ethics, Communication, and Freedom Credits: 3-6
- NCLC 346 - Art as Social Action Credits: 4
- NCLC 361 - Neighborhood, Community, and Identity Credits: 3-6
- NCLC 378 - Medicine, Justice, and Public Policy Credits: 3
- NCLC 381 - When Cultural Worlds Collide Credits: 6
- NCLC 435 - Leadership in a Changing Environment Credits: 4
- PHIL 309 - Bioethics Credits: 3
- PHIL 343 - Topics in Environmental Philosophy Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- PROV 342 - The George Mason Debates in Current Affairs Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 327 - Psychology in the Community Credits: 3
- PSYC 333 - Industrial and Organizational Psychology Credits: 3
- RELI 359 - Muslims in the United States Credits: 3
- RELI 360 - Religion and Politics Credits: 3
- SOCI 300 - Social Control and Freedom Credits: 3
- SOCI 301 - Criminology Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 307 - Social Movements and Political Protest Credits: 3
- SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
- SOCI 315 - Women and Men in Society Credits: 3
- SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
- SOCI 332 - The Urban World Credits: 3
- SOCI 340 - Power, Politics, and Society Credits: 3
- SOCI 352 - Social Problems Credits: 3
- SOCI 355 - Social Inequality Credits: 3
- SOCI 360 - Youth Culture and Society Credits: 3
- SOCI 373 - The Community Credits: 3
• SOCI 382 - Education in Contemporary Society Credits: 3
• SOCI 385 - Sociology of Religion Credits: 3
• SOCI 421 - Field Work in Social Change Credits: 3
• SOCI 492 - Sociology of Organizations Credits: 3
• SOCW 340 - Human Behavior within Macro Systems Credits: 3
• SOCW 351 - Social Policy and Social Justice Credits: 3
• SOCW 415 - Child and Family Welfare Credits: 3
• SOCW 425 - Planning and Organizing for Community Change Credits: 3
• WMST 301 - Sex and Gender in Contemporary Society Credits: 3
• WMST 302 - Cultural Constructions of Sexualities Credits: 3

▲ Concentration in International Conflict (MACR)

Students choose four courses from:

• ANTH 302 - Peoples and Cultures of Latin America Credits: 3
• ANTH 308 - Peoples and Cultures of the Middle East Credits: 3
• ANTH 309 - Peoples and Cultures of India Credits: 3
• ANTH 312 - Political Anthropology Credits: 3
• ANTH 324 - Warfare, Violence, and Sacrifice in Antiquity Credits: 3
• ANTH 331 - Refugees Credits: 3
• ANTH 332 - Cross-cultural perspectives on globalization Credits: 3
• ANTH 365 - Race and Racism Credits: 3
• ANTH 370 - Environment and Culture Credits: 3
• ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
• BIOL 301 - Biology and Society Credits: 3
• COMM 305 - Foundations of Intercultural Communication Credits: 3
• CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
• CONF 345 - Social Dynamics of Terrorism, Security, and Justice Credits: 3
• CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
• CONF 394 - Human Rights and Inequality Credits: 3
• CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
• CRIM 308 - Human Rights and Justice Credits: 3
• CRIM 405 - Law and Justice around the World Credits: 3
• CRIM 475 - Theory and Politics of Terrorism Credits: 3
• CULT 320 - Globalization and Culture Credits: 3
• ECON 360 - Economics of Developing Areas Credits: 3
• ECON 361 - Economic Development of Latin America Credits: 3
• ECON 362 - African Economic Development Credits: 3
• ECON 385 - International Economic Policy Credits: 3
• ECON 390 - International Economics Credits: 3
• EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
• GGS 301 - Political Geography Credits: 3
• GGS 303 - Conservation of Resources and Environment Credits: 3
• GGS 304 - Populations Dimensions of Global Change Credits: 3
• GGS 305 - Economic Geography Credits: 3
• GGS 316 - Geography of Latin America Credits: 3
- GGS 325 - Geography of North Africa and the Middle East Credits: 3
- GOVT 322 - International Relations Theory Credits: 3
- GOVT 331 - Government and Politics of Latin America Credits: 3
- GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
- GOVT 333 - Government and Politics of Asia Credits: 3
- GOVT 334 - Government and Politics of Europe Credits: 3
- GOVT 336 - Political Development and Change Credits: 3
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
- GOVT 340 - Central Asian Politics Credits: 3
- GOVT 342 - Diplomacy Credits: 3
- GOVT 343 - International Political Economy Credits: 3
- GOVT 344 - American Foreign Policy Credits: 3
- GOVT 345 - Political Islam Credits: 3
- GOVT 421 - Contemporary Political Ideologies Credits: 3
- GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
- GOVT 443 - Law and Ethics of War Credits: 3
- GOVT 446 - International Law and Organization Credits: 3
- GOVT 447 - Revolution and International Politics Credits: 3
- GOVT 448 - Ethics and International Politics Credits: 3
- HIST 353 - History of Traditional China Credits: 3
- HIST 354 - Modern China Credits: 3
- HIST 356 - Modern Japan Credits: 3
- HIST 360 - History of South Africa Credits: 3
- HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
- HIST 366 - Comparative Slavery Credits: 3
- HIST 370 - War and American Society Credits: 3
- HIST 460 - Modern Iran Credits: 3
- HIST 461 - Arab-Israeli Conflict Credits: 3
- HIST 462 - Women in Islamic Society Credits: 3
- HIST 466 - Origins of Conflict in Southern Africa Credits: 3
- MSOM 305 - Managing in a Global Economy Credits: 3
- NCLC 314 - Conflict, Trauma and Healing Credits: 6
- NCLC 334 - Environmental Justice Credits: 4
- NCLC 381 - When Cultural Worlds Collide Credits: 6
- NCLC 416 - Refugee and Internal Displacement Credits: 3
- NCLC 423 - Management in the Global Marketplace Credits: 6
- PHIL 327 - Contemporary Western Political Theory Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- RELI 360 - Religion and Politics Credits: 3
- RELI 405 - Religion, Values, and Globalization Credits: 3
- RELI 407 - Women in the World's Religions Credits: 3
- RELI 490 - Comparative Study of Religions Credits: 3
- SOCI 307 - Social Movements and Political Protest Credits: 3
- SOCI 320 - Social Structure and Globalization Credits: 3
- SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
- SOCI 340 - Power, Politics, and Society Credits: 3
• SOCI 385 - Sociology of Religion Credits: 3

▲ Individualized Concentration (IND)

Students interested in creating their own concentration can work with an advisor to decide upon a curriculum that will fulfill the requirements of the BA in Conflict Analysis and Resolution.

Additional Courses in Practice:

Students may choose to take additional practice courses from the following:

• CONF 331 - Simulation in Community and Organizational Conflict Resolution Credits: 1
• CONF 341 - Global Conflict Resolution Practice Credits: 1

Total: 120 credits

Conflict Analysis and Resolution, BS

Banner Code: CA-BS-CONF

Students must fulfill all requirements for bachelor's degrees including university general education requirements. S-CAR majors must also complete 57 major requirement credits for the BS degree.

Students pursuing a double major/degree with a program outside of the S-CAR undergraduate program will be expected to fulfill all of the university general education and college requirements necessary to complete the second major. Please check with the second major department concerning additional requirements.

Writing-Intensive Requirement

All Mason students are required to complete at least one course designated as “writing intensive” in their major at the 300-level or above. CONF 302 has been designated “writing intensive.”

Advising

S-CAR advisors help students create interdisciplinary programs that meet their interests and career goals. All majors and minors are strongly encouraged to meet regularly with an S-CAR academic advisor who will help students develop and follow a coherent plan of study and complete the degree in a timely manner.

Physical Education Courses

PHED courses offered by the School of Recreation, Health, and Tourism that are activity courses cannot be counted toward credits required for a degree in S-CAR. Students may use nonactivity PHED courses for elective credit for S-CAR degrees.

Degree Requirements
• Non-Western culture (3 credits): from College of Humanities and Social Sciences BA requirement list. Cannot be double counted for global understanding requirement.

Research methods (6 credits):

STAT 250 and an additional research methods course from the approved list.

- STAT 250 - Introductory Statistics I Credits: 3

3 credits chosen from:

- ANTH 380 - Language and Culture Credits: 3
- ANTH 450 - Qualitative Methods: Nonstatistical Approaches in Culture and Social Research Credits: 3
- ENGH 318 - Introduction to Cultural Studies Credits: 3
- GOVT 300 - Research Methods and Analysis Credits: 4
- GOVT 366 - Public Policy Analysis Credits: 3
- HIST 300 - Introduction to Historical Method Credits: 3
- PHIL 357 - Philosophy of the Social Sciences Credits: 3
  or
- SOCI 599 - Issues in Sociology Credits: 1-3
- PSYC 300 - Statistics in Psychology Credits: 4
- PSYC 301 - Research Methods in Psychology Credits: 3
- SOCI 303 - Sociological Research Methodology Credits: 4
- SOCI 313 - Statistics for the Behavioral Sciences Credits: 4
- SOCI 410 - Social Surveys and Attitude and Opinion Measurements Credits: 3
- STAT 362 - Introduction to Computer Statistical Packages Credits: 3
- STAT 474 - Introduction to Survey Sampling Credits: 3

Required core courses (18 credits):

- CONF 101 - Conflict and Our World Credits: 3
- CONF 210 - Theories of Conflict Analysis and Resolution Credits: 3
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
- CONF 301 - Research and Inquiry in Conflict Resolution Credits: 3
- CONF 302 - Culture, Identity, and Conflict Credits: 3
- CONF 490 - Integration Credits: 3

Required bridge courses (9 credits):

- CONF 320 - Interpersonal Conflict Analysis and Resolution Credits: 3
- CONF 330 - Community, Group, and Organizational Conflict Analysis and Resolution Credits: 3
- CONF 340 - Global Conflict Analysis and Resolution Credits: 3
Field experience (3 credits):

Students can choose to fulfill this requirement through an internship, service learning, or study abroad. Please contact an S-CAR advisor for information on the opportunities/procedures for field experience credit. Students interested in study abroad should register through the Center for Global Education. More information can be found at globaled.gmu.edu. Prior approval by the major advisor is required for all field experience options. Other options may be available. Please check with S-CAR advising office with questions.

Internship/Service Learning:

- CONF 370 - Internship Field Experience Credits: 1-9

Study Abroad:

- CONF 385 - International Field Experience Credits: 3

Concentration courses (12 credits):

Students choose courses from one of three levels of conflict: interpersonal (micro level), community and organizational (mezzo level), and international (macro level). Students should choose classes that pertain to their concentration and are listed as approved. Students are encouraged to check special topics courses each semester and think creatively about the applicability of courses that support learning in their chosen concentration. Independent study approved by the advisor is also an option. The S-CAR director will consider student requests for approval of courses not listed below.

▲ Concentration in Interpersonal Conflict (MICR)

Students choose four courses from:

- ANTH 315 - Socialization Processes: Family, Childhood, Personality in Cross-Cultural Perspective Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 371 - Psychological Anthropology Credits: 3
- COMM 301 - Foundations of Interpersonal Communication Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- COMM 401 - Interpersonal Communication in the Workplace Credits: 3
- COMM 434 - Interviewing Credits: 3
- COMM 465 - Topics in Communication and Gender Credits: 3
- CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
- CONF 325 - Dialogue and Difference Credits: 3
- CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
- CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
- CRIM 302 - Delinquency Credits: 3
- CRIM 307 - Social Inequality, Crime, and Justice Credits: 3
- CRIM 404 - Crime Victims and Victimization Credits: 3
- CRIM 406 - Family Law and the Justice System Credits: 3
- FRLN 380 - Topics in the Sociopolitics of Language Credits: 3
• FRLN 385 - Multilingualism, Identity, and Power Credits: 3
• GOVT 355 - Public Personnel Administration Credits: 3
• NCLC 305 - Conflict Resolution and Transformation Credits: 6
• NCLC 310 - Violence and Gender Credits: 3-6
• NCLC 314 - Conflict, Trauma and Healing Credits: 6
• NCLC 315 - Spirituality and Conflict Transformation Credits: 6
• NCLC 317 - Issues in Family Relationships Credits: 4
• NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
• NCLC 331 - The Nonprofit Sector Credits: 4
• NCLC 334 - Environmental Justice Credits: 4
• NCLC 335 - Ethics, Communication, and Freedom Credits: 3-6
• PHIL 309 - Bioethics Credits: 3
• PHIL 355 - Theories of Ethics Credits: 3
• PSYC 231 - Social Psychology Credits: 3
• PSYC 313 - Child Psychology Credits: 3
• PSYC 314 - Adolescent Psychology Credits: 3
• PSYC 321 - Counseling Psychology Credits: 3
• PSYC 324 - Personality Theory Credits: 3
• PSYC 379 - Applied Cross-Cultural Psychology Credits: 3
• PSYC 466 - Psychology of Intimate Relationships Credits: 3
• PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3
• RELI 360 - Religion and Politics Credits: 3
• SOCI 300 - Social Control and Freedom Credits: 3
• SOCI 302 - Sociology of Delinquency Credits: 3
• SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
• SOCW 301 - Laboratory in Interpersonal Communication Credits: 4
• SOCW 323 - Human Behavior and the Life Course Credits: 3
• WMST 301 - Sex and Gender in Contemporary Society Credits: 3

▲ Concentration in Community and Organizational Conflict (MEZZ)

Students choose four courses from:

• ANTH 301 - Native North Americans Credits: 3
• ANTH 310 - Social Organization and Kinship Credits: 3
• ANTH 340 - Comparative Perspectives on Immigration Credits: 3
• ANTH 365 - Race and Racism Credits: 3
• ANTH 488 - Gender, Sexuality, and Culture Credits: 3
• COMM 305 - Foundations of Intercultural Communication Credits: 3
• COMM 326 - Rhetoric of Social Movements and Political Controversy Credits: 3
• COMM 335 - Organizational Communication Credits: 3
• COMM 350 - Mass Communication and Public Policy Credits: 3
• COMM 432 - Political Communication Credits: 3
• COMM 434 - Interviewing Credits: 3
• CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
• CONF 325 - Dialogue and Difference Credits: 3
• CONF 345 - Social Dynamics of Terrorism, Security, and Justice Credits: 3
- CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
- CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
- CRIM 302 - Delinquency Credits: 3
- CRIM 306 - Criminal Justice Ethics Credits: 3
- CRIM 406 - Family Law and the Justice System Credits: 3
- CRIM 407 - Advanced Topics in Law and Society Credits: 3
- CRIM 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
- ECON 309 - Economic Problems and Public Policies Credits: 3
- ECON 320 - Labor Problems Credits: 3
- GGS 306 - Urban Geography Credits: 3
- GGS 406 - Suburban Geography Credits: 3
- GOVT 301 - Public Law and the Judicial Process Credits: 3
- GOVT 309 - Government and Politics of Metropolitan Areas Credits: 3
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 355 - Public Personnel Administration Credits: 3
- GOVT 365 - State and Regional Public Policy Credits: 3
- GOVT 414 - Politics of Race and Gender Credits: 3
- GOVT 460 - Surveillance and Privacy in Contemporary Society Credits: 3
- HIST 350 - U.S. Women's History Credits: 3
- MSOM 301 - Managing People and Organizations Credits: 3
- NCLC 304 - Social Movements and Community Activism Credits: 4
- NCLC 310 - Violence and Gender Credits: 3-6
- NCLC 314 - Conflict, Trauma and Healing Credits: 6
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
- NCLC 334 - Environmental Justice Credits: 4
- NCLC 335 - Ethics, Communication, and Freedom Credits: 3-6
- NCLC 346 - Art as Social Action Credits: 4
- NCLC 361 - Neighborhood, Community, and Identity Credits: 3-6
- NCLC 378 - Medicine, Justice, and Public Policy Credits: 3
- NCLC 381 - When Cultural Worlds Collide Credits: 6
- NCLC 435 - Leadership in a Changing Environment Credits: 4
- PHIL 309 - Bioethics Credits: 3
- PHIL 343 - Topics in Environmental Philosophy Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- PROV 342 - The George Mason Debates in Current Affairs Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 327 - Psychology in the Community Credits: 3
- PSYC 333 - Industrial and Organizational Psychology Credits: 3
- RELI 359 - Muslims in the United States Credits: 3
- RELI 360 - Religion and Politics Credits: 3
- SOCI 300 - Social Control and Freedom Credits: 3
- SOCI 301 - Criminology Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 307 - Social Movements and Political Protest Credits: 3
- SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
- SOCI 315 - Women and Men in Society Credits: 3
- SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
• SOCI 332 - The Urban World Credits: 3
• SOCI 340 - Power, Politics, and Society Credits: 3
• SOCI 352 - Social Problems Credits: 3
• SOCI 355 - Social Inequality Credits: 3
• SOCI 373 - The Community Credits: 3
• SOCI 382 - Education in Contemporary Society Credits: 3
• SOCI 385 - Sociology of Religion Credits: 3
• SOCI 421 - Field Work in Social Change Credits: 3
• SOCI 492 - Sociology of Organizations Credits: 3
• SOCW 340 - Human Behavior within Macro Systems Credits: 3
• SOCW 351 - Social Policy and Social Justice Credits: 3
• SOCW 415 - Child and Family Welfare Credits: 3
• SOCW 425 - Planning and Organizing for Community Change Credits: 3
• WMST 301 - Sex and Gender in Contemporary Society Credits: 3
• WMST 302 - Cultural Constructions of Sexualities Credits: 3

▲ Concentration in International Conflict (MACR)

Students choose four courses from:

• ANTH 302 - Peoples and Cultures of Latin America Credits: 3
• ANTH 308 - Peoples and Cultures of the Middle East Credits: 3
• ANTH 309 - Peoples and Cultures of India Credits: 3
• ANTH 312 - Political Anthropology Credits: 3
• ANTH 324 - Warfare, Violence, and Sacrifice in Antiquity Credits: 3
• ANTH 331 - Refugees Credits: 3
• ANTH 332 - Cross-cultural perspectives on globalization Credits: 3
• ANTH 365 - Race and Racism Credits: 3
• ANTH 370 - Environment and Culture Credits: 3
• ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
• BIOL 301 - Biology and Society Credits: 3
• COMM 305 - Foundations of Intercultural Communication Credits: 3
• CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
• CONF 345 - Social Dynamics of Terrorism, Security, and Justice Credits: 3
• CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
• CONF 394 - Human Rights and Inequality Credits: 3
• CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
• CRIM 308 - Human Rights and Justice Credits: 3
• CRIM 405 - Law and Justice around the World Credits: 3
• CRIM 475 - Theory and Politics of Terrorism Credits: 3
• CULT 320 - Globalization and Culture Credits: 3
• ECON 360 - Economics of Developing Areas Credits: 3
• ECON 361 - Economic Development of Latin America Credits: 3
• ECON 362 - African Economic Development Credits: 3
• ECON 385 - International Economic Policy Credits: 3
• ECON 390 - International Economics Credits: 3
• EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- GGS 301 - Political Geography Credits: 3
- GGS 303 - Conservation of Resources and Environment Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 305 - Economic Geography Credits: 3
- GGS 316 - Geography of Latin America Credits: 3
- GGS 325 - Geography of North Africa and the Middle East Credits: 3
- GOVT 322 - International Relations Theory Credits: 3
- GOVT 331 - Government and Politics of Latin America Credits: 3
- GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
- GOVT 333 - Government and Politics of Asia Credits: 3
- GOVT 334 - Government and Politics of Europe Credits: 3
- GOVT 336 - Political Development and Change Credits: 3
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
- GOVT 340 - Central Asian Politics Credits: 3
- GOVT 342 - Diplomacy Credits: 3
- GOVT 343 - International Political Economy Credits: 3
- GOVT 344 - American Foreign Policy Credits: 3
- GOVT 345 - Political Islam Credits: 3
- GOVT 421 - Contemporary Political Ideologies Credits: 3
- GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
- GOVT 443 - Law and Ethics of War Credits: 3
- GOVT 446 - International Law and Organization Credits: 3
- GOVT 447 - Revolution and International Politics Credits: 3
- GOVT 448 - Ethics and International Politics Credits: 3
- HIST 353 - History of Traditional China Credits: 3
- HIST 354 - Modern China Credits: 3
- HIST 356 - Modern Japan Credits: 3
- HIST 360 - History of South Africa Credits: 3
- HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
- HIST 366 - Comparative Slavery Credits: 3
- HIST 370 - War and American Society Credits: 3
- HIST 460 - Modern Iran Credits: 3
- HIST 461 - Arab-Israeli Conflict Credits: 3
- HIST 462 - Women in Islamic Society Credits: 3
- HIST 466 - Origins of Conflict in Southern Africa Credits: 3
- MSOM 305 - Managing in a Global Economy Credits: 3
- NCLC 314 - Conflict, Trauma and Healing Credits: 6
- NCLC 334 - Environmental Justice Credits: 4
- NCLC 381 - When Cultural Worlds Collide Credits: 6
- NCLC 416 - Refugee and Internal Displacement Credits: 3
- NCLC 423 - Management in the Global Marketplace Credits: 6
- PHIL 327 - Contemporary Western Political Theory Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- RELI 360 - Religion and Politics Credits: 3
- RELI 405 - Religion, Values, and Globalization Credits: 3
- RELI 407 - Women in the World's Religions Credits: 3
- RELI 490 - Comparative Study of Religions Credits: 3
- SOCI 307 - Social Movements and Political Protest Credits: 3
- SOCI 320 - Social Structure and Globalization Credits: 3
- SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
- SOCI 340 - Power, Politics, and Society Credits: 3
- SOCI 385 - Sociology of Religion Credits: 3

▲ Individualized Concentration (IND)

Students interested in creating their own concentration can work with an advisor to decide upon a curriculum that will fulfill the requirements of the BS in Conflict Analysis and Resolution.

Major electives (6 credits):

Elective courses can be chosen from the approved concentration course list at any level but may not count for both concentration and elective credit. Independent study approved by the advisor is also an option.

Additional Courses in Practice:

Students may choose to take additional practice courses from the following:

- CONF 331 - Simulation in Community and Organizational Conflict Resolution Credits: 1
- CONF 341 - Global Conflict Resolution Practice Credits: 1

Total: 120 credits

Undergraduate Minor

Conflict Analysis and Resolution Minor

Banner Code: CONF

Students pursuing a minor complete 18 credits. At least 9 credits of the minor must be applied only to the S-CAR minor and may not be used to fulfill requirements of the student's major, major concentration, or another minor.

Advising

S-CAR advisors help students create interdisciplinary programs that meet their interests and career goals. All majors and minors are strongly encouraged to meet regularly with an S-CAR academic advisor who will help students develop and follow a coherent plan of study and complete the degree in a timely manner.

Course Work
Students pursuing a minor complete 18 credits distributed as follows:

**Required core courses (9 credits):**

- CONF 101 - Conflict and Our World Credits: 3
- CONF 210 - Theories of Conflict Analysis and Resolution Credits: 3
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3

**One of three bridge courses (3 credits):**

- CONF 320 - Interpersonal Conflict Analysis and Resolution Credits: 3
- CONF 330 - Community, Group, and Organizational Conflict Analysis and Resolution Credits: 3
- CONF 340 - Global Conflict Analysis and Resolution Credits: 3

**Emphasis courses (6 credits):**

Students choose courses from any of three levels of conflict: interpersonal (micro level), community and organizational (mezzo level), and international (macro level). With permission of the advisor, students may use other CONF designated courses to fulfill emphasis requirements. The S-CAR director will consider student requests for approval of courses not listed below.

**Emphasis in Interpersonal Conflict**

- ANTH 315 - Socialization Processes: Family, Childhood, Personality in Cross-Cultural Perspective Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 371 - Psychological Anthropology Credits: 3
- COMM 301 - Foundations of Interpersonal Communication Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- COMM 401 - Interpersonal Communication in the Workplace Credits: 3
- COMM 434 - Interviewing Credits: 3
- COMM 465 - Topics in Communication and Gender Credits: 3
- CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
- CONF 325 - Dialogue and Difference Credits: 3
- CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
- CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
- CRIM 302 - Delinquency Credits: 3
- CRIM 307 - Social Inequality, Crime, and Justice Credits: 3
- CRIM 404 - Crime Victims and Victimization Credits: 3
- CRIM 406 - Family Law and the Justice System Credits: 3
- FRLN 380 - Topics in the Sociopolitics of Language Credits: 3
- FRLN 385 - Multilingualism, Identity, and Power Credits: 3
- GOVT 355 - Public Personnel Administration Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 3
- NCLC 310 - Violence and Gender Credits: 3-6
- NCLC 314 - Conflict, Trauma and Healing Credits: 6
- NCLC 315 - Spirituality and Conflict Transformation Credits: 6
- NCLC 317 - Issues in Family Relationships Credits: 4
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
- NCLC 331 - The Nonprofit Sector Credits: 4
- NCLC 334 - Environmental Justice Credits: 4
- NCLC 335 - Ethics, Communication, and Freedom Credits: 3-6
- PHIL 309 - Bioethics Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 313 - Child Psychology Credits: 3
- PSYC 314 - Adolescent Psychology Credits: 3
- PSYC 321 - Counseling Psychology Credits: 3
- PSYC 324 - Personality Theory Credits: 3
- PSYC 379 - Applied Cross-Cultural Psychology Credits: 3
- PSYC 466 - Psychology of Intimate Relationships Credits: 3
- PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3
- RELI 360 - Religion and Politics Credits: 3
- SOCI 300 - Social Control and Freedom Credits: 3
- SOCW 301 - Laboratory in Interpersonal Communication Credits: 4
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
- SOCW 323 - Human Behavior and the Life Course Credits: 3
- WMST 301 - Sex and Gender in Contemporary Society Credits: 3

Emphasis in Community and Organizational Conflict

- ANTH 301 - Native North Americans Credits: 3
- ANTH 310 - Social Organization and Kinship Credits: 3
- ANTH 340 - Comparative Perspectives on Immigration Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 488 - Gender, Sexuality, and Culture Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- COMM 326 - Rhetoric of Social Movements and Political Controversy Credits: 3
- COMM 335 - Organizational Communication Credits: 3
- COMM 350 - Mass Communication and Public Policy Credits: 3
- COMM 432 - Political Communication Credits: 3
- COMM 434 - Interviewing Credits: 3
- CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
- CONF 325 - Dialogue and Difference Credits: 3
- CONF 345 - Social Dynamics of Terrorism, Security, and Justice Credits: 3
- CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
- CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
- CRIM 302 - Delinquency Credits: 3
• CRIM 306 - Criminal Justice Ethics Credits: 3
• CRIM 406 - Family Law and the Justice System Credits: 3
• CRIM 407 - Advanced Topics in Law and Society Credits: 3
• CRIM 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
• ECON 309 - Economic Problems and Public Policies Credits: 3
• ECON 320 - Labor Problems Credits: 3
• GGS 306 - Urban Geography Credits: 3
• GGS 406 - Suburban Geography Credits: 3
• GOVT 301 - Public Law and the Judicial Process Credits: 3
• GOVT 309 - Government and Politics of Metropolitan Areas Credits: 3
• GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
• GOVT 355 - Public Personnel Administration Credits: 3
• GOVT 365 - State and Regional Public Policy Credits: 3
• GOVT 414 - Politics of Race and Gender Credits: 3
• GOVT 460 - Surveillance and Privacy in Contemporary Society Credits: 3
• HIST 350 - U.S. Women's History Credits: 3
• MSOM 301 - Managing People and Organizations Credits: 3
• NCLC 304 - Social Movements and Community Activism Credits: 4
• NCLC 310 - Violence and Gender Credits: 3-6
• NCLC 314 - Conflict, Trauma and Healing Credits: 6
• NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
• NCLC 334 - Environmental Justice Credits: 4
• NCLC 335 - Ethics, Communication, and Freedom Credits: 3-6
• NCLC 346 - Art as Social Action Credits: 4
• NCLC 361 - Neighborhood, Community, and Identity Credits: 3-6
• NCLC 378 - Medicine, Justice, and Public Policy Credits: 3
• NCLC 381 - When Cultural Worlds Collide Credits: 6
• NCLC 435 - Leadership in a Changing Environment Credits: 4
• PHIL 309 - Bioethics Credits: 3
• PHIL 343 - Topics in Environmental Philosophy Credits: 3
• PHIL 355 - Theories of Ethics Credits: 3
• PROV 342 - The George Mason Debates in Current Affairs Credits: 3
• PSYC 231 - Social Psychology Credits: 3
• PSYC 327 - Psychology in the Community Credits: 3
• PSYC 333 - Industrial and Organizational Psychology Credits: 3
• RELI 359 - Muslims in the United States Credits: 3
• RELI 360 - Religion and Politics Credits: 3
• SOCI 300 - Social Control and Freedom Credits: 3
• SOCI 301 - Criminology Credits: 3
• SOCI 302 - Sociology of Delinquency Credits: 3
• SOCI 307 - Social Movements and Political Protest Credits: 3
• SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
• SOCI 315 - Women and Men in Society Credits: 3
• SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
• SOCI 332 - The Urban World Credits: 3
• SOCI 340 - Power, Politics, and Society Credits: 3
• SOCI 352 - Social Problems Credits: 3
- SOCI 355 - Social Inequality Credits: 3
- SOCI 360 - Youth Culture and Society Credits: 3
- SOCI 373 - The Community Credits: 3
- SOCI 382 - Education in Contemporary Society Credits: 3
- SOCI 385 - Sociology of Religion Credits: 3
- SOCI 421 - Field Work in Social Change Credits: 3
- SOCI 492 - Sociology of Organizations Credits: 3
- SOCW 340 - Human Behavior within Macro Systems Credits: 3
- SOCW 351 - Social Policy and Social Justice Credits: 3
- SOCW 415 - Child and Family Welfare Credits: 3
- SOCW 425 - Planning and Organizing for Community Change Credits: 3
- WMST 301 - Sex and Gender in Contemporary Society Credits: 3
- WMST 302 - Cultural Constructions of Sexualities Credits: 3

**Emphasis in International Conflict**

- ANTH 302 - Peoples and Cultures of Latin America Credits: 3
- ANTH 308 - Peoples and Cultures of the Middle East Credits: 3
- ANTH 309 - Peoples and Cultures of India Credits: 3
- ANTH 312 - Political Anthropology Credits: 3
- ANTH 324 - Warfare, Violence, and Sacrifice in Antiquity Credits: 3
- ANTH 331 - Refugees Credits: 3
- ANTH 332 - Cross-cultural perspectives on globalization Credits: 3
- ANTH 365 - Race and Racism Credits: 3
- ANTH 370 - Environment and Culture Credits: 3
- ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
- BIOL 301 - Biology and Society Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- CONF 315 - Discovering Organizations and Actors in the Conflict Field Credits: 3
- CONF 345 - Social Dynamics of Terrorism, Security, and Justice Credits: 3
- CONF 393 - Philosophy, Conflict Theory, and Violence Credits: 3
- CONF 394 - Human Rights and Inequality Credits: 3
- CONF 399 - Special Topics in Conflict Analysis and Resolution Credits: 3
- CRIM 308 - Human Rights and Justice Credits: 3
- CRIM 405 - Law and Justice around the World Credits: 3
- CRIM 475 - Theory and Politics of Terrorism Credits: 3
- CULT 320 - Globalization and Culture Credits: 3
- ECON 360 - Economics of Developing Areas Credits: 3
- ECON 361 - Economic Development of Latin America Credits: 3
- ECON 362 - African Economic Development Credits: 3
- ECON 385 - International Economic Policy Credits: 3
- ECON 390 - International Economics Credits: 3
- EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- GGS 301 - Political Geography Credits: 3
- GGS 303 - Conservation of Resources and Environment Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 305 - Economic Geography Credits: 3
- GGS 316 - Geography of Latin America Credits: 3
- GGS 325 - Geography of North Africa and the Middle East Credits: 3
- GOVT 322 - International Relations Theory Credits: 3
- GOVT 331 - Government and Politics of Latin America Credits: 3
- GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
- GOVT 333 - Government and Politics of Asia Credits: 3
- GOVT 334 - Government and Politics of Europe Credits: 3
- GOVT 336 - Political Development and Change Credits: 3
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
- GOVT 340 - Central Asian Politics Credits: 3
- GOVT 342 - Diplomacy Credits: 3
- GOVT 343 - International Political Economy Credits: 3
- GOVT 344 - American Foreign Policy Credits: 3
- GOVT 345 - Political Islam Credits: 3
- GOVT 421 - Contemporary Political Ideologies Credits: 3
- GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
- GOVT 443 - Law and Ethics of War Credits: 3
- GOVT 446 - International Law and Organization Credits: 3
- GOVT 447 - Revolution and International Politics Credits: 3
- GOVT 448 - Ethics and International Politics Credits: 3
- HIST 353 - History of Traditional China Credits: 3
- HIST 354 - Modern China Credits: 3
- HIST 356 - Modern Japan Credits: 3
- HIST 360 - History of South Africa Credits: 3
- HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
- HIST 366 - Comparative Slavery Credits: 3
- HIST 370 - War and American Society Credits: 3
- HIST 460 - Modern Iran Credits: 3
- HIST 461 - Arab-Israeli Conflict Credits: 3
- HIST 462 - Women in Islamic Society Credits: 3
- HIST 466 - Origins of Conflict in Southern Africa Credits: 3
- MSOM 305 - Managing in a Global Economy Credits: 3
- NCLC 314 - Conflict, Trauma and Healing Credits: 6
- NCLC 334 - Environmental Justice Credits: 4
- NCLC 381 - When Cultural Worlds Collide Credits: 6
- NCLC 416 - Refugee and Internal Displacement Credits: 3
- NCLC 423 - Management in the Global Marketplace Credits: 6
- PHIL 327 - Contemporary Western Political Theory Credits: 3
- PHIL 355 - Theories of Ethics Credits: 3
- RELI 360 - Religion and Politics Credits: 3
- RELI 405 - Religion, Values, and Globalization Credits: 3
- RELI 407 - Women in the World's Religions Credits: 3
- RELI 490 - Comparative Study of Religions Credits: 3
- SOCI 307 - Social Movements and Political Protest Credits: 3
Additional Courses in Practice:

Students may choose to take additional practice courses from the following:

- CONF 331 - Simulation in Community and Organizational Conflict Resolution Credits: 1
- CONF 341 - Global Conflict Resolution Practice Credits: 1

Bachelor's/Accelerated Master's Program

Conflict Analysis and Resolution, BA or BS/Conflict Analysis and Resolution, Accelerated MS

Web: scar.gmu.edu

Highly qualified undergraduates with the major of Conflict Analysis and Resolution may apply to the accelerated master's degree program in Conflict Analysis and Resolution. If accepted, students will be able to earn an undergraduate and master's degree in Conflict Analysis and Resolution after satisfactory completion of 155 credits, sometimes within five years.

This program of study is offered by the School for Conflict Analysis and Resolution.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MS in Conflict Analysis and Resolution, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

While undergraduate students, accelerated master's students complete the two graduate courses indicated on their Accelerated Master's Program Application with a minimum grade of B in each course. They must maintain a minimum GPA of 3.00 in all
coursework and in coursework applied to their major. At the beginning of the last semester of undergraduate study, the Bachelor's/Accelerated Master's Transition Form must be submitted to the Office of the University Registrar. Upon completion and conferral of the undergraduate degree they are admitted to graduate status.

As graduate students, accelerated master's students have an advanced standing. They must meet all master's degree requirements except for the two courses they completed as undergraduates. Students must begin their master's program the semester immediately following conferral of the undergraduate degree.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition Form.

**Dual Degree**

**Social Work and Conflict Analysis and Resolution Dual Degree, MS (S-CAR)**

*Banner Codes: HH-MSW-SOCW and CA-MS-CONF*

The Department of Social Work and the School for Conflict Analysis and Resolution have joined forces to offer a three year dual-degree program. Students can earn both an MSW and an MS in conflict analysis and resolution while taking advantage of the diversity of the Washington, D.C., metropolitan area and the university’s proximity to the nation’s capital. This is the only dual-degree program of its kind.

**Admission Requirements**

Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall semester only. Students interested in the 3-year dual degree program submit one online Application for Graduate Admission, select MSW in Social Work as a primary program, and submit all application support materials, including the MSW Application Materials to the Office of Graduate Admission in the College of Health and Human Services. Applicants should communicate their interest in completing the dual degree program in their essays, and recommendations should address the dual program interest. Students must be admitted to both programs in the same semester (fall only) to be admitted to the dual degree program. For application deadlines and detailed application requirements please refer to the Graduate Application Database. Interested students should consult the MSW program website and the MSW program director for additional information prior to applying.
Degree Requirements

Students must successfully complete the following:

Social Work Courses (51 credits)

- SOCW 623 - Human Behavior and Social Systems I Credits: 3
- SOCW 624 - Human Behavior and Social Systems II Credits: 3
- SOCW 651 - Social Policies, Programs, and Services Credits: 3
- SOCW 652 - Influencing Social Policy Credits: 3
- SOCW 657 - Direct Social Work Practice I Credits: 3
- SOCW 658 - Direct Social Work Practice II Credits: 3
- SOCW 670 - Communication and Technology for Social Work Practice Credits: 3
- SOCW 672 - Foundation Field Practicum and Seminar I Credits: 3
- SOCW 673 - Foundation Field Practicum and Seminar II Credits: 3
- SOCW 684 - Social Work and the Law Credits: 3
- SOCW 685 - Organizational Leadership for Social Workers Credits: 3
- SOCW 687 - Empowering Communities for Change Credits: 3
- SOCW 688 - Advanced Research in Social Work Credits: 3
- SOCW 694 - Social Change Practicum I Credits: 3
- SOCW 695 - Social Change Practicum II Credits: 3

Choose two of the following:
- SOCW 653 - Immigration Policy Credits: 3
- SOCW 654 - Social Policy for Children and Youth Credits: 3
- SOCW 655 - Aging Programs and Policies Credits: 3

Conflict Analysis and Resolution Courses (35 credits)

- CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3
- CONF 601 - Theories of Conflict and Conflict Resolution Credits: 3
- CONF 610 - Philosophy and Methods of Conflict Research Credits: 3
- CONF 620 - Reflective Practice in Interpersonal-Multiparty Conflicts Credits: 3
- CONF 642 - Integration of Theory and Practice Credits: 3
- CONF 694 - Internship Credits: 1-6
  3 credits of CONF 694 are required
- CONF 795 - Professional Development Seminars Credits: 1-2
  5 credits of CONF 795 are required

Electives

- 12 credits of CONF electives, selected with approval from S-CAR

Total: 86 credits
Master's Degree

Conflict Analysis and Resolution, MS

Banner Code: CA-MS-CONF

This two-year professional program prepares students for practice and further academic work by integrating conflict analysis and resolution theory, research, and practical techniques. Participants study the theory, methods, and ethical perspectives of the field, and apply this knowledge in laboratory simulations and workshops, internships, and field practice. Graduates work in a variety of settings where conflict resolution is useful and interest groups are in conflict with current and emergent public policy. Examples are businesses, unions, government agencies, religious groups, court systems, educational institutions, community centers, international relief and development organizations, and consulting firms.

Admission Requirements

In addition to meeting all admission requirements for graduate study, applicants must submit all undergraduate and graduate transcripts; three letters of recommendation, one of which should be from a faculty member in the applicant’s undergraduate or graduate major field; a resume or curriculum vitae; and a 750- to 1,000-word essay on goals and reasons for seeking admission to the program. GRE or other standardized test scores are not required but may be submitted. The TOEFL is required of international students. For more information, see the Admission of International Students section in the Admissions chapter of this catalog. Students can be admitted to the MS program for both the Fall and Spring semesters.

Background courses in social sciences, as well as prior work experience, are desirable. Prior graduate academic work is evaluated on an individual basis for possible transfer credit and fulfillment of program requirements; however, Mason usually does not reduce the total credits required for the degree. Students may enroll on a full- or part-time basis.

Transfer of Non-Degree Credit

A maximum of 12 credits of S-CAR graduate courses taken at George Mason as a non-degree graduate student, or as part of S-CAR's graduate certificate program may be transferred into the M.S. program. How credit will be counted will be determined in consultation with the accepted student's advisor. A maximum of 6 credits of non-S-CAR courses taken as non-degree credit can be counted toward the M.S. program. Courses counted toward another degree cannot be transferred.

Adding an S-CAR Certificate Program

Students may elect to complete an S-CAR Graduate Certificate in addition to the MS program. Graduate Certificates are opportunities for students to further tailor their academic program and specialize in a specific area of Conflict Resolution Practice. Certain graduate certificate courses can be used to fulfill MS program requirements. Students should consult with the Certificate Program Director and the Master's Program Director for policies on counting certificate courses toward the MS degree.

Peace Corps Master's International

The Master's International, a joint program of Mason and the Peace Corps enables participants to prepare for Peace Corps volunteer services while earning an MS in Conflict Analysis and Resolution. Students apply separately to the Peace Corps and to Mason. The 41 credit curriculum provides students with skills and tools to prepare them for work as community development
leaders during their Peace Corps Service. An accelerated pathway is provided to allow Peace Corps volunteers to complete 29 credits prior to overseas service (including a summer term), students then receive 6 credits of CONF 694 internship for overseas Peace Corps service. Mason will provide tuition support for the 6 credits of CONF 694 earned overseas. Students then return to Mason for a semester to complete the final 6 credits. Students accepted into the academic program but waiting for notification of acceptance from the Peace Corps may begin their Master's program but will not be eligible for tuition support until they are accepted into the Peace Corps. More information on Master's International Program can be found at www.peacecorps.gov/index.cfm

Dual Degree Program with the University of Malta

Students have the opportunity to pursue a M.S. in Conflict Analysis and Resolution from George Mason University and a M.A. in Conflict Resolution and Mediterranean Security from the University of Malta through an innovative Dual Degree Program. This 14 month program is offered only on site at the University of Malta. Students interested in pursuing the dual degree should apply through University of Malta at www.um.edu.mt/imp.

Degree Requirements

Forty-one credits are required: 15 in required core courses, 20 in elective courses, and 6 in integrative courses (students can choose from a defined list). Mason requires all students to complete the master’s degree within six years of their official admission date.

Because the choice of electives can vary significantly according to individual goals or needs, each student should develop a plan of study that should be discussed once each semester with the advisor and updated as appropriate.

Please check the S-CAR student handbook for information on registration procedures.

Required Courses (15 Credits)

- CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3 CONF 501 should be taken in the first semester of a student's coursework.
- CONF 601 - Theories of Conflict and Conflict Resolution Credits: 3
- CONF 610 - Philosophy and Methods of Conflict Research Credits: 3
- CONF 620 - Reflective Practice in Interpersonal-Multiparty Conflicts Credits: 3
- CONF 642 - Integration of Theory and Practice Credits: 3 CONF 642 should be taken in the last semester of a student's M.S. coursework.

Elective Courses (20 Credits)

Electives are any 500, 600, or 700 level CONF courses, except required courses. With the advisor's approval, each student is eligible to include a maximum of 6 credits of electives from outside the S-CAR program, including courses in other Mason departments, consortium courses, and transfer courses from other universities.

Integrative Courses (6 Credits)

Students choose one of the following options:
Applied Practice and Theory

The Applied Practice and Theory (APT) Program is a 6-credit course that runs yearlong. It is designed to take the concepts presented in class and practiced in labs into real situations with conflict and consequences. Students work in teams integrating research and practice with theory development and applied ethics.

- **CONF 690 - Practicum in Conflict Analysis and Resolution** Credits: 3

Internship

The internship program provides students with opportunities to use and develop conflict resolution skills, integrate theory and practice of conflict analysis and resolution, and network with professionals in the field to enhance employment opportunities. Experience does not necessarily have to be explicitly hands on. CONF 694 requires at least 160 hours of supervised work on a project toward the analysis or resolution of conflict. Such work must be spelled out in a memorandum of agreement to be signed by the student, the site supervisor, and the internship coordinator before the internship begins. Students may either take 6 credits of CONF 694 or 3 credits of CONF 694 & 3 of CONF 795.

- **CONF 694 - Internship** Credits: 1-6
- **CONF 795 - Professional Development Seminars** Credits: 1-2

Thesis

Students wishing to complete a Master's Thesis are strongly encouraged to take CONF 797 (Proposal Development) the semester before beginning the thesis project. Before registering, students must have identified a Master's thesis committee chair to supervise the project. Students should contact S-CAR student services to receive the CRN to register for thesis.

- **CONF 797 - Proposal Development** Credits: 1
- **CONF 799 - Master's Thesis** Credits: 1-6

Directed Readings

Only two directed readings (CONF 697) may be applied toward requirements for the master’s degree (maximum 6 credits).

- **CONF 697 - Directed Reading** Credits: 1-3

Total: 41 credits

Master's Level Certificate

Advanced Skills Graduate Certificate

Banner Code: CA-CERG-CARA
This 15-credit program is specifically tailored to provide students with practical knowledge of conflict analysis and resolution relevant to their focused areas of work. Designed for midcareer professionals studying in a cohort environment, the certificate programs integrate conflict analysis and resolution theory, research, and practical technique. These programs use intensive course sessions, lecture, seminar, and applied mentored learning in real and simulated situations to prepare students to use conflict analysis and resolution approaches in their work in a variety of fields. The Advanced Skills Certificate covers conflict resolution skills in challenging conflicts and considers innovative and emerging practices.

Admission Requirements

In addition to meeting all admission requirements for graduate study, applicants must submit an undergraduate transcript showing completion of an undergraduate degree or equivalent, a cover letter specifying interest in the program, two letters of recommendation and a curriculum vitae or résumé indicating relevant work experience.

In addition, prior work experience in areas related to the chosen graduate certificate is desirable. GRE or other standardized test scores are not required but may be submitted. The TOEFL is required of international students. For more information, see the Admission of International Students section in the Admissions chapter of this catalog. Although students may enter the program in either the fall or spring semester, they are strongly encouraged to participate fully in the cohort learning experience by enrolling for the fall semester, taking two courses in the fall and two in the spring, and completing their certificate with the final course in the summer. The capstone course is only offered in the summer, students admitted for the spring term should expect their certificate program to take at least 18 months.

Please note Graduate Certificate courses are offered only in Saturday and Sunday sessions. Please check the Schedule of Classes for each term to identify course meeting dates, and specific add/drop dates for these partial semester courses.

The graduate certificate in Advanced Skills may only be pursued on a part-time basis, unless a student is concurrently enrolled in another degree program or takes additional courses over those required for the certificate program.

Certificate Requirements

Fifteen credits are required for each graduate certificate.

Required Courses (12 Credits)

- CONF 502 - Intensive Introduction to Conflict Analysis and Resolution Credits: 3 (fall and spring)
- CONF 650 - Conflict Analysis and Resolution Advanced Skills Credits: 3 (fall)
- CONF 660 - Conflict Assessment and Program Evaluation Credits: 3 (spring)
- CONF 668 - Applied Integration for Graduate Certificates Credits: 3 (summer)

Elective Courses (3 Credits)

Students may choose from the following:

- CONF 656 - Integrating Complementary Approaches in Conflict Analysis and Resolution Credits: 3 (spring)
- CONF 657 - Facilitation Skills Credits: 3 (spring)
- CONF 658 - Diversity and Difference in Conflict Analysis and Resolution Credits: 3 (spring)
- CONF 659 - Leadership in Conflict Analysis and Resolution Credits: 3 (spring)
- CONF 665 - Special Topics in Conflict Analysis and Resolution Credits: 3
Note:

Application of any other course toward fulfillment of the elective requirement must be approved by the Certificate Program Director.

Total: 15 credits

Collaborative Leadership in Community Planning Graduate Certificate

Banner Code: CA-CERG-CARC

This 15-credit program is specifically tailored to provide students with practical knowledge of conflict analysis and resolution relevant to their focused areas of work. Designed for midcareer professionals studying in a cohort environment, the certificate programs integrate conflict analysis and resolution theory, research, and practical technique. These programs use intensive course sessions, lecture, seminar, and applied mentored learning in real and simulated situations to prepare students to use conflict analysis and resolution approaches in their work in a variety of fields. The Collaborative Leadership in Community Planning Certificate covers designing collaborative processes to work with diverse stakeholders to build meaningful and lasting shared agreements in land use, development or other community planning contexts.

Admission Requirements

In addition to meeting all admission requirements for graduate study, applicants must submit an undergraduate transcript showing completion of an undergraduate degree or equivalent, a cover letter specifying interest in the program, two letters of recommendation, and a curriculum vitae or résumé indicating relevant work experience.

In addition, prior work experience in areas related to the chosen graduate certificate is desirable. GRE or other standardized test scores are not required but may be submitted. The TOEFL is required of international students. For more information, see the Admission of International Students section in the Admissions chapter of this catalog. Although students may enter the program in either the fall or spring semester, they are strongly encouraged to participate fully in the cohort learning experience by enrolling for the fall semester, taking two courses in the fall and two in the spring, and completing their certificate with the final course in the summer. The capstone course is only offered in the summer, students admitted for the spring term should expect their certificate program to take at least 18 months.

Please note Graduate Certificate courses are offered only in Saturday and Sunday sessions. Please check the Schedule of Classes for each term to identify course meeting dates, and specific add/drop dates for these partial semester courses.

The graduate certificate in Collaborative Leadership in Community Planning may only be pursued on a part-time basis, unless a student is concurrently enrolled in another degree program or takes additional courses over those required for the certificate program.

Certificate Requirements

Fifteen credits are required for each graduate certificate.

Required Courses (12 Credits)
• CONF 502 - Intensive Introduction to Conflict Analysis and Resolution Credits: 3 (fall and spring)
• CONF 651 - Conflict Analysis and Resolution for Collaborative Leadership in Community Planning Credits: 3 (fall)
• CONF 660 - Conflict Assessment and Program Evaluation Credits: 3 (spring)
• CONF 668 - Applied Integration for Graduate Certificates Credits: 3 (summer)

Elective Courses (3 Credits)

Students may choose from the following:

• CONF 656 - Integrating Complementary Approaches in Conflict Analysis and Resolution Credits: 3 (spring)
• CONF 657 - Facilitation Skills Credits: 3 (spring)
• CONF 658 - Diversity and Difference in Conflict Analysis and Resolution Credits: 3 (spring)
• CONF 659 - Leadership in Conflict Analysis and Resolution Credits: 3 (spring)
• CONF 665 - Special Topics in Conflict Analysis and Resolution Credits: 3

Note:

Application of any other course toward fulfillment of the elective requirement must be approved by the Certificate Program Director.

Total: 15 credits

Environmental Conflict Resolution and Collaboration Graduate Certificate

Banner Code: CA-CERG-ECR

The School for Conflict Analysis and Resolution (S-CAR) and the Department of Environmental Science and Policy (ESP) jointly offer a 15-credit Graduate Certificate in Environmental Conflict Resolution and Collaboration. This certificate is intended for mid-career professionals working in federal, state and local government as well as others whose positions involve negotiating environmental conflicts.

The Graduate Certificate in Conflict Resolution and Collaboration focuses on a systems approach to environmental conflict to understand how it is embedded within formal legal, regulatory, and ecological systems as well as informal networks of governance. Coursework focuses on the strategic thinking that is required for assessing and designing appropriate ECR processes; as well as understanding the public interest and questions of social justice and sustainability that make environmental conflict particularly important and challenging.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

Admissions Procedures and Requirements
For admission, students must show graduation from a Bachelor’s program (or equivalent) and related work experience. Applicants to this graduate certificate program should hold a B.A. or B.S. degree in a discipline related to the certificate’s theme from an accredited university, with a minimum GPA of 3.00. Applicants must submit a completed Mason graduate application, along with official transcripts, resume, VA domicile classification form, and TOEFL scores if they are foreign nationals. GRE scores and letters of recommendation are not required, but will considerably strengthen an application, if available. Questions and application materials should be directed to the S-CAR Graduate Admissions office. Depending on the background of the individual student, the certificate director may recommend remedial or preparatory courses tailored to student’s needs. Students may transfer no more than 3 credit hours into the certificate program with the approval of the academic director.

The graduate certificate in Environmental Conflict Resolution and Collaboration may only be pursued on a part-time basis, unless a student is concurrently enrolled in another degree program or takes additional courses over those required for the certificate program.

Certificate Requirements

Fifteen credits are required for the graduate certificate.

Core Courses (9 Credits)

The core courses listed below are crosslisted with EVPP 682, EVPP 683, EVPP 684, and students may register for either using the CONF course number or equivalent EVPP course number.

- CONF 682 - Principles of Environmental Conflict Resolution Credits: 3 (fall)
- CONF 683 - Environmental Conflict Resolution and Collaboration: Situation Assessment, Process Design and Best Practices Credits: 3 (spring)
- CONF 684 - Environmental Conflict Resolution and Collaboration: Leadership Practicum/Capstone Credits: 3 (spring)

Skills and Competencies Courses (3 - 6 Credits)

This requirement is fulfilled through the following courses, depending upon the student’s academic background. Students without prior background in either conflict resolution or environmental science should take both EVPP 607 and CONF 501 or 502, and none of the elective courses listed below. Students without an environmental background should take EVPP 607. Students without a conflict resolution background should take either CONF 501 or CONF 502. Students with both prior environmental and conflict background may choose among a set of for-credit “short courses” with approval of the Certificate Director to satisfy this requirement.

- EVPP 607 - Fundamentals of Ecology Credits: 3 for students without a prior environmental background
- CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3 for students without a prior conflict resolution background
  OR
- CONF 502 - Intensive Introduction to Conflict Analysis and Resolution Credits: 3 for students without a prior conflict resolution background

Elective Course (0-3 Credits)

Students may choose from the following courses. Application of any other course toward fulfillment of the elective requirement must be approved by the Director of the Certificate Program.

- CONF 695 - Selected Topics Credits: 3 topic must be approved by Certificate Program Director
EVPP 623 - Translating Environmental Policy into Action Credits: 3
EVPP 505 - Selected Topics in Environmental Science Credits: 0-4
EVPP 521 - Marine Conservation Credits: 3
EVPP 620 - Development of U.S. Environmental Policies Credits: 3
EVPP 626 - Environment and Development in Asia Credits: 3
EVPP 635 - Environment and Society Credits: 3
EVPP 638 - Corporate Environmental Management and Policy Credits: 3
EVPP 641 - Environmental Science and Public Policy Credits: 3
EVPP 642 - Environmental Policy Credits: 3
EVPP 677 - Applied Ecology and Ecosystem Management. Credits: 3
EVPP 741 - Advanced Topics in Environmental Science and Public Policy Credits: 0-4 topic must be approved by Certificate Program Director

Total: 15 credits

Prevention, Reconstruction, and Stabilization Contexts Graduate Certificate

Banner Code: CA-CERG-CARP

This 15-credit program is specifically tailored to provide students with practical knowledge of conflict analysis and resolution relevant to their focused areas of work. Designed for midcareer professionals studying in a cohort environment, the certificate programs integrate conflict analysis and resolution theory, research, and practical technique. These programs use intensive course sessions, lecture, seminar, and applied mentored learning in real and simulated situations to prepare students to use conflict analysis and resolution approaches in their work in a variety of fields. The Prevention, Reconstruction, and Stabilization Contexts Graduate Certificate augments development, defense, security, or humanitarian aid work experience with the theories and skills of conflict analysis and resolution for designing, implementing, and evaluating conflict-sensitive initiatives internationally in areas of potential violence and post-conflict reconstruction and stabilization. Considers cross-sectoral approaches to long-term violence prevention and constructive conflict resolution.

Admission Requirements

In addition to meeting all admission requirements for graduate study, applicants must submit an undergraduate transcript showing completion of an undergraduate degree or equivalent, a cover letter specifying interest in the program, two letters of recommendation, and a curriculum vitae or résumé indicating relevant work experience.

In addition, prior work experience in areas related to the chosen graduate certificate is desirable. GRE or other standardized test scores are not required but may be submitted. The TOEFL is required of international students. For more information, see the Admission of International Students section in the Admissions chapter of this catalog. Although students may enter the program in either the fall or spring semester, they are strongly encouraged to participate fully in the cohort learning experience by enrolling for the fall semester, taking two courses in the fall and two in the spring, and completing their certificate with the final course in the summer. The capstone course is only offered in the summer, students admitted for the spring term should expect their certificate program to take at least 18 months.

Please note Graduate Certificate courses are offered only in Saturday and Sunday sessions. Please check the Schedule of Classes for each term to identify course meeting dates, and specific add/drop dates for these partial semester courses.
The graduate certificate in Prevention, Reconstruction and Stabilization Contexts may only be pursued on a part-time basis, unless a student is concurrently enrolled in another degree program or takes additional courses over those required for the certificate program.

Certificate Requirements

Fifteen credits are required for each graduate certificate.

Required Courses (12 Credits)

- CONF 502 - Intensive Introduction to Conflict Analysis and Resolution Credits: 3 (fall and spring)
- CONF 652 - Conflict Analysis and Resolution for Prevention, Reconstruction, and Stabilization Contexts Credits: 3 (fall)
- CONF 660 - Conflict Assessment and Program Evaluation Credits: 3 (spring)
- CONF 668 - Applied Integration for Graduate Certificates Credits: 3 (summer)

Elective Courses (3 Credits)

Students may choose from the following:

- CONF 656 - Integrating Complementary Approaches in Conflict Analysis and Resolution Credits: 3
- CONF 657 - Facilitation Skills Credits: 3
- CONF 658 - Diversity and Difference in Conflict Analysis and Resolution Credits: 3
- CONF 659 - Leadership in Conflict Analysis and Resolution Credits: 3
- CONF 665 - Special Topics in Conflict Analysis and Resolution Credits: 3

Note:

Application of any other course toward fulfillment of the elective requirement must be approved by the Certificate Program Director.

Total: 15 credits

World Religions, Diplomacy, and Conflict Resolution Graduate Certificate

Banner Code: CA-CERG-CARW

This 15-credit program is specifically tailored to provide students with practical knowledge of conflict analysis and resolution relevant to their focused areas of work. Designed for midcareer professionals studying in a cohort environment, the certificate programs integrate conflict analysis and resolution theory, research, and practical technique. These programs use intensive course sessions, lecture, seminar, and applied mentored learning in real and simulated situations to prepare students to use conflict
analysis and resolution approaches in their work in a variety of fields. The World Religions, Diplomacy and Conflict Resolution Certificate considers strategies to reduce global violence and terrorism by incorporating the best moral practices of religious communities into policy planning, diplomacy, civil society building and democratization. Covers strategies to elicit moderate moral religious expression in conflict regions to strengthen civil society and democracy.

**Admission Requirements**

In addition to meeting all admission requirements for graduate study, applicants must submit an undergraduate transcript showing completion of an undergraduate degree or equivalent, a cover letter specifying interest in the program, two letters of recommendation, and a curriculum vitae or résumé indicating relevant work experience.

In addition, prior work experience in areas related to the chosen graduate certificate is desirable. GRE or other standardized test scores are not required but may be submitted. The TOEFL is required of international students. More information, see the Admission of International Students section in the Admissions chapter of this catalog. Although students may enter the program in either the fall or spring semester, they are strongly encouraged to participate fully in the cohort learning experience by enrolling for the fall semester, taking two courses in the fall and two in the spring, and completing their certificate with the final course in the summer. The capstone course is only offered in the summer, students admitted for the spring term should expect their certificate program to take at least 18 months.

Please note Graduate Certificate courses are offered only in Saturday and Sunday sessions. Please check the Schedule of Classes for each term to identify course meeting dates, and specific add/drop dates for these partial semester courses.

The graduate certificate in World Religions, Diplomacy, and Conflict Resolution may only be pursued on a part-time basis, unless a student is concurrently enrolled in another degree program or takes additional courses over those required for the certificate program.

**Certificate Requirements**

Fifteen credits are required for each graduate certificate.

**Required Courses (12 Credits)**

- CONF 502 - Intensive Introduction to Conflict Analysis and Resolution Credits: 3 (fall and spring)
- CONF 653 - World Religions, Diplomacy, and Conflict Resolution Credits: 3 (fall)
- CONF 660 - Conflict Assessment and Program Evaluation Credits: 3 (spring)
- CONF 668 - Applied Integration for Graduate Certificates Credits: 3 (summer)

**Elective Courses (3 Credits)**

Students may choose from the following:

- CONF 656 - Integrating Complementary Approaches in Conflict Analysis and Resolution Credits: 3 (spring)
- CONF 657 - Facilitation Skills Credits: 3 (spring)
- CONF 658 - Diversity and Difference in Conflict Analysis and Resolution Credits: 3 (spring)
- CONF 659 - Leadership in Conflict Analysis and Resolution Credits: 3 (spring)
- CONF 665 - Special Topics in Conflict Analysis and Resolution Credits: 3
Note:

Application of any other course toward fulfillment of the elective requirement must be approved by the Certificate Program Director.

Total: 15 credits

Doctoral Degree

Conflict Analysis and Resolution, PhD

Banner Code: CA-PHD-CONF

The doctoral program, the first of its kind in the United States, provides advanced study for students in the fields of conflict analysis and conflict resolution. Students are prepared for careers as researchers, theoreticians, and teachers in higher education, and as policy administrators, analysts, and consultants in the public and the private sectors.

The program stresses a close link between knowledge of theory and process in the resolution of conflict. For this, training in the methods of research and analysis is emphasized. In addition, students are expected to obtain a background in a substantive area of conflict, usually related to the topic of the dissertation.

Admission

A master’s or equivalent degree is required for admission to the Ph.D. program. In addition to meeting all admission requirements for graduate study, applicants must submit all undergraduate and graduate transcripts; three letters of recommendation, one of which should be from a faculty member in the applicant's undergraduate or graduate major field; a 750 to 1,000 word essay on goals and reasons for seeking admission to the program; a written sample of work that shows the applicant’s potential for completing dissertation research in a doctoral program, and a resume or curriculum vitae. The Graduate Record Exam (GRE) or other standardized test scores are not required but may be submitted. The Test of English as a Foreign Language (TOEFL) is required of international students. For more information, see the Admission of International Students section in the Admissions chapter of this catalog. Although students may enroll on a full- or part-time basis, entry into the program is in the fall semester only.

Reduction of Credit

Since a Master's degree or equivalent is required for admission, students will automatically receive a 15 credit reduction of the number of credits required.

Students may have the required number of credits reduced by up to 15 additional credits based on relevant previous coursework. The actual number of applied credits is determined in consultation with the student’s advisor and the program coordinator after a review of courses taken, subsequent to a student's admission to the program.

Transfer of Non-Degree Credit
A maximum of 12 credits of S-CAR graduate courses taken at George Mason as a non-degree graduate student, or as part of S-
CARR's graduate certificate program may be transferred into the Ph.D. program. How credit will be counted will be determined in
consultation with the student's advisor. A maximum of 6 credits of non-S-CAR courses taken as non-degree credit can be counted
toward the Ph.D. program. Courses counted toward another degree cannot be transferred.

Adding an S-CAR Certificate Program

Students may elect to complete an S-CAR graduate certificate in addition to the Ph.D. program. Graduate certificates are
opportunities for students to further tailor their academic program and specialize in a specific area of Conflict Resolution
practice. Certain graduate certificate courses can be used to fulfill PhD program requirements. Students should consult with the
Certificate Program Director and Doctoral Program Director for policies on counting certificate courses toward the Ph.D. degree.

Degree Requirements

The PhD in conflict analysis and resolution requires completion of 72 credits. Since a Master's degree or equivalent is required
for admission, students will automatically receive a 15 credit reduction of the number of credits required, bringing the required
credits to 57. Students may have the required number of credits reduced by up to 15 more credits based on relevant previous
coursework. Students must complete coursework, language requirements, comprehensive exams, and advancement to candidacy
within six years of their official admission date.

All doctoral students should meet with their faculty advisor before starting classes to develop a plan of study. This plan should
show the sequence of courses anticipated. It should be based on a discussion between the student and the advisor about the
student's interest and goals. The plan should ensure that the student completes coursework efficiently and is able to build toward
candidacy. The student and the advisor should then meet at least once each semester thereafter to review and amend the plan. The
Program Director should receive a copy of each new or revised plan of study.

Foreign Language Requirement

Every doctoral student must show competence in a foreign language (that is, a language other than their native tongue) before
advancing to candidacy. Students cannot register for CONF 998 without evidence of meeting this requirement. International
students may use English as their foreign language and the TOEFL as a demonstration of competency. Neither American Sign
Language nor computer languages can be used to fulfill this requirement. All students, regardless of how recently language
courses have been taken, are required to fulfill the same standard before advancing to candidacy. For additional information, visit
mcl.gmu.edu/placement-testing

Required Courses (30 Credits)

CONF 801 and CONF 900 are required for all students. Students take 15 credits of foundation coursework in the areas of theory,
research and practice. Students also take 9 credits of specialization courses approved by the Program Director.

- CONF 801 - Introduction to Conflict Analysis and Resolution Credits: 3 Should be taken in the first semester of
coursework.
- CONF 900 - Integrating Theory, Practice, and Method in Conflict Analysis Credits: 3 Should be taken in the last
semester of coursework.

Foundation Courses

Students complete 15 credits of foundation courses including Theoretical Foundations (6 credits), Research Foundations (6
credits), and Practice Foundations (3 credits).
Theoretical Foundations - choose two of the following:

- CONF 802 - Theories of the Person Credits: 3
- CONF 803 - Structural Theories Credits: 3
- CONF 804 - Alternate Theoretical Foundations Credits: 3

Research Foundations - choose two of the following:

- CONF 811 - Quantitative Foundations Credits: 3
- CONF 812 - Qualitative Foundations: Social Sciences Credits: 3
- CONF 813 - Qualitative Foundations: Humanities Credits: 3

Practice Foundations - choose one of the following:

- CONF 820 - Reflective Practice in Interpersonal-Multiparty Conflicts Credits: 3
- CONF 890 - Practicum in Conflict Analysis and Resolution Credits: 3

Specialization Courses

Students take 9 credits of graduate level specialization courses, evenly distributed across the areas of theory, research, and practice. The Doctoral Program Director must approve courses.

Reduction of Credit (15 Credits)

Elective Courses (15 credits)

Electives are any 500-, 600-, and 700-level CONF courses that are not required. With the advisor’s approval, each student may include a maximum of 6 credits of electives from outside the S-CAR Program, including courses in other Mason departments, consortium courses, and transfer courses from other universities. The intent is to allow students to have maximum flexibility in selecting courses to build skills and knowledge needed in dissertation work. CONF 897 - Directed Reading may be taken to meet the requirement. Only two directed readings classes (6 credits) can be applied toward doctoral elective requirements.

Comprehensive Examination

Students are eligible to sit for the comprehensive examination when they have completed all the requirements of course work in the doctoral program with the exception of CONF 998 and 999 and have demonstrated competence in a foreign language.
Upon completion of all coursework, doctoral students are eligible to take the comprehensive examination. A student is advanced to candidacy upon completion of the examination. The examination will be held twice each year, in January and in August. Students who do not pass the exam should form a plan of study with their advisor and the Doctoral Director that will prepare them to re-take comps. The comprehensive examination may be retaken two times for a total of three attempts. If, after three attempts, the student was not able to pass the examination they should consult with the Doctoral and Master's Directors about the possibility of transferring to the MS program.

**Advancement to Candidacy**

Upon completing course work (except dissertation) listed on the Plan of Study, meeting the language requirement, and passing "comps" students will be advanced to candidacy and will be personally notified of this by the Dean of S-CAR. Students have one year to complete the proposal with required sign-off from all committee members and, then, a maximum of four years to complete and defend the dissertation.

**Dissertation Research (12 credits)**

Students are required to complete 12 combined credits of CONF 998 (Doctoral Dissertation Proposal) and CONF 999 (Doctoral Dissertation Research), including at least 3 credits of CONF 999. Students must have a signed dissertation proposal in order to register for CONF 999.

- CONF 998 - Doctoral Dissertation Proposal Credits: 1-6 (All CONF 998 courses are graded In Progress until completion of the proposal. At that time, a grade of Satisfactory is issued.)
- CONF 999 - Doctoral Dissertation Research Credits: 1-12 (All CONF 999 courses are graded In Progress until the dissertation defense is successfully completed. At that time, a grade of Satisfactory is issued.)

**Dissertation Committee**

During the 12 months following advancement to candidacy, the candidate should form their dissertation committee at the same time as they are working on their dissertation proposal. The Dissertation Committee must include a chair person from among S-CAR faculty and at least two other members of the graduate faculty, one of whom must be a non-S-CAR GMU faculty member. The candidate should notify the Dean and Doctoral Director when a tentative committee has been formed. The membership of the committee must be approved by the Doctoral Director and the Dean of the School. The Dean will formally appoint the dissertation committee. The Dean will inform the student, committee members, and Doctoral Director when the committee has been appointed.

**Dissertation Proposal**

The first job of the committee is to approve the candidate's dissertation proposal. The proposal is the candidate's description (in some detail) of his/her dissertation project. It will include an argument about the hypothesis/theory question being tackled and the specific methods of research to be used. It should be prepared in consultation with the chair of the committee, but must be seen and approved by all members. A signed cover page from that proposal must be filed with the Doctoral Director. Failure to complete the formation of a committee and an approved proposal by the end of the 12 month period will result in the candidate's dismissal from the doctoral program. (Candidates may appeal to the Dean for a further extension of this dissertation preparation period but such appeals will be allowed only on grounds of documented illness or family emergency). Candidates should consult thesis.gmu.edu/ to ensure the proposal is in the correct format and has been submitted to all the appropriate offices.

After receiving permission from the full committee, the candidate makes an oral presentation of the dissertation proposal before the committee and the Doctoral Director that is also open to other S-CAR faculty, fellow students, and other scholars. In scheduling the defense, it is the student's responsibility to ensure that all members of the committee are available and will be present for the defense.
Writing the Dissertation and its Defense

The chair of the dissertation committee usually takes most of the responsibility for guiding the overall project and the writing of the dissertation, although all members (and other useful persons) should be consulted as appropriate. It is their collective responsibility to ensure a quality piece of work. When advanced to candidacy, the Guide for Preparing Graduate Thesis, Dissertation and Projects tells exactly how to prepare a physically acceptable thesis. Please visit thesis.gmu.edu/ to ensure formatting guidelines are met and submission procedures followed.

It is essential that doctoral committee members have sufficient time to read and evaluate dissertation drafts with care prior to the dissertation defense date. It is also essential that students have sufficient time after the defense to do final revisions, editing and formatting. If the University determines the deadlines for final library submission deadline is May 1 for example, the defense must take place prior to April 1 and the full draft dissertation must be delivered to the full committee before March 1.

The dissertation is to be orally defended in public with at least the whole committee present. (The University may also send a representative, if it wishes.) However, anyone else is free to attend. This ensures that the University's standards are met, and offers an opportunity to all to hear the result of the work. After a successful defense, the cover page is signed by the members of the Dissertation Committee, and the dissertation is filed with the University. An additional signed copy should be delivered to the S-CAR Library.

Dissertations must be presented to the library in the proper format or they will not be accepted. Please visit the University Dissertation & Thesis Services web site at thesis.gmu.edu/ for dissertation formatting requirements and submission deadlines. Mason's Dissertation and Thesis Coordinator may be reached at udt@gm.edu or 703-993-2222.

Total: 72 credits
Schools

- School of Recreation, Health, and Tourism
- Graduate School of Education

The College of Education and Human Development (CEHD) comprises the School of Recreation, Health, and Tourism (RHT), and the Graduate School of Education (GSE). The college is committed to excellence, innovation, and collaboration in research and the preparation of professionals for the highest levels of practice and service in diverse schools, organizations, and communities.

CEHD provides leadership in transforming schools, organizations, and communities through research, teaching, and collaboration. CEHD faculty members prepare scholars and practitioners through multidisciplinary programs of study that facilitate the understanding, integration, and application of knowledge. Through research activities, faculty and students expand and refine the knowledge base for teaching and learning. In response to the richness and complexity of a pluralistic society, CEHD infuses diversity into academic programs and research. The faculty develops and supports knowledgeable, caring, and reflective professionals who facilitate excellence and equity for all learners. CEHD students and faculty demonstrate their growth and development in ways meaningful to their communication and professional organizations. Innovative programs and the integration of technology provide opportunities for students to develop, examine, evaluate, and practice professional knowledge, skills, and dispositions.

Administration

Mark Ginsberg, Dean
Martin Ford, Senior Associate Dean
Peter Barcher, Associate Dean for Research
Ellen Rodgers, Associate Dean for Student and Academic Affairs
C. Stephen White, Associate Dean for Academic Program Development

Undergraduate Degrees, Minors, and Certificates

CEHD offers four undergraduate degrees, 14 minors, and one undergraduate certificate. The School of Recreation, Health, and Tourism within the College of Education and Human Development collaborates with the College of Humanities and Social Sciences to offer three minors in interdisciplinary areas of study. Students may elect to take a minor in addition to their major field of study. For policies governing all minors, see the Academic Policies chapter of this catalog. Students interested in earning a minor should complete the appropriate section of the Change/Declaration of Academic Program form.

In addition, the college also collaborates with the College of Science (Departments of Atmospheric, Oceanic, and Earth Science; Chemistry and Biochemistry; Mathematical Sciences; and the School of Physics, Astronomy and Computational Sciences) and the College of Visual and Performing Arts (Schools of Dance and Music) to provide seven collaborative undergraduate degree
concentrations or emphases in Biology Education, Chemistry Education, Earth Science Education, Mathematics Education Music Education, Physics Education, and Theater Education, and one licensure program in Dance Licensure. CEHD also collaborates with New Century College to support three interdisciplinary degree concentrations which prepare students for graduate study in education. The requirements for each degree, minor, and certificate are described on their respective catalog pages.

**Graduate Degrees and Certificates**

CEHD offers one doctoral degree, eight master's degrees, and 36 graduate certificates. The requirements for each degree and certificate are described on their respective catalog pages.

**Applicable to All Students**

In addition to the policies stated in the first chapters of this catalog, the following policies and procedures apply to all students in the college.

**Communication Policy**

All correspondence from the program, school, college, and university administration is sent to the student’s official Mason e-mail account. Students should use their Mason e-mail account to communicate with their programs and other administrative units.

**Academic Policies**

Students are ultimately responsible for their academic progress towards their degrees and/or certificates. They are strongly advised to consult the Academic Policies chapter of this catalog for information concerning university-wide requirements for degree and nondegree students in addition to those for this college. Students with questions regarding academic policies and college-level requirements should contact the CEHD Student and Academic Affairs (Thompson Hall, Suite 2300; 703-993-2080; cehdacad@gmu.edu). Additional policy information and forms are available online at http://cehd.gmu.edu/oasa/.

**Grading Policy**

All CEHD undergraduate and graduate students are held to the university grading policies as described in the Academic Policies section of this catalog. Those students enrolled in a CEHD licensure program, however, must earn a B- or better in all licensure coursework. The following licensure programs have more stringent grading policies that are detailed in their respective catalog sections: MEd in Curriculum and Instruction with concentrations in Elementary Education, English as a Second Language, Foreign Language (Arabic, Chinese, French, German, Japanese, Latin, Russian, and Spanish), International Education FAST TRAIN ESOL (PK-12), International Education FAST TRAIN Elementary PK-6, Secondary Education; and the MEd in Counseling and Development.

**Grade Appeals**

Students may appeal grades that they believe were assigned unjustly or were based on unclear criteria in accord with the Academic Policies chapter of this catalog. Grade appeals should initially be directed to the Program Coordinator for courses taken within the College of Education and Human Development. The decision may be further appealed to the Associate Dean for Student and Academic Affairs, who reserves the right to convene the elected members of the CEHD Appeals Committee if there is sufficient evidence of procedural irregularity. The Associate Dean’s decision is not subject to review or further appeal.

**Professional Teacher Licensure**
CEHD is responsible for professional courses, special standards, and licensure recommendations for students completing state-approved (Virginia) licensure programs that prepare teachers, administrators, counselors, and related-instructional personnel.

Initial teacher licensure is available at the undergraduate level in Biology, Chemistry, Dance, Earth Science, Health and Physical Education, Mathematics, Music, Physics, Secondary Education English, and Theatre Arts. Initial teacher licensure is available at the graduate level in Art, Early Childhood, Elementary, English as a Second Language, Foreign Language, Secondary, and Theatre Arts. The Special Education Program offers initial teacher licensure exclusively through graduate certificates that include Early Childhood Special Education, Visual Impairment, Students with Disabilities who Access the General Curriculum, and Students with Disabilities who Access the Adapted Curriculum.

For more information and the dates and times of Think You Want to Be a Teacher? information sessions, please contact the CEHD Office of Admissions (Thompson Hall, Suite 2700; 703-993-2892; cehdgrad@gmu.edu). Additional information is available online at http://cehd.gmu.edu/admissions/.

Course Work

CEHD offers all course work designated ATEP, ECED, EDAL, EDCD, EDCI, EDEP, EDIT, EDLE, EDRD, EDRS, EDSE, EDUC, EFHP, HEAL, IETT, KINE, MNPE, PHED, PRLS, SPMT, SRST, and TOUR in the Courses chapter of this catalog.

School of Recreation, Health, and Tourism

Phone: 703-993-2060
Web: rht.gmu.edu

The School of Recreation, Health, and Tourism (RHT) offers two master's degrees, four undergraduate degrees, six minors, and one undergraduate certificate. In addition to school-based minors, RHT offers three interdisciplinary minors with other units. The MS in Exercise Science, Fitness, and Health Promotion (EFHP) prepares professionals to more adequately serve their communities or pursue advanced academic study in the exercise science field. The MS in Sport and Recreation Studies meets the growing need for professionals and academics in the areas of international sport management, recreation administration, sport and leisure studies, sport coaching, and sport management. This degree prepares students for administrative, coaching, or further academic study. The BS in Athletic Training, accredited by the Commission on the Accreditation of Athletic Training Education (CAATE), prepares students for careers in athletic training and graduate study in other allied health professions. The BS in Health, Fitness, and Recreation Resources prepares students for supervisory and management careers in private and public parks and recreation systems (clinical and community), health promotion agencies, non-profit and for-profit sport organizations. The Parks and Outdoor Recreation and Therapeutic Recreation concentrations are accredited by the National Recreation and Park Association (NRPA). The BSEd in Physical Education, accredited by the National Council for the Accreditation of Teacher Education (NCATE), prepares students for a teaching career (K–12) in public and private schools. The BS in Tourism and Events Management degree is one of the fastest growing majors at the university.

For more information and the dates and time of RHT Orientation Sessions, please contact the RHT Office (Bull Run Hall [Prince William Campus] Suite 213; 703-993-2098; srht@gmu.edu). Additional information is available online at rht.gmu.edu.

Faculty

**Professors:** Anderson, Brayley, Nauright, D. Wiggins

**Associate professors:** J. Ambegaonkar, R. Baker, Banville, Bever, S. Caswell, Daniels, Dieke, Jones, Kozlowski, Miller, P. Park, P. Rodgers, Schack, B. Wiggins

**Assistant professors:** Aidoo, A. Caswell, Cortes, Esherick, Ferry, C.H. Lee, S. Lee, Redmond, Robison

**Instructors:** S. Ambegaonkar, Casserly, DeGregorio, Krout, Norden, Parham
Course Work

RHT offers course work designated ATEP, EFHP, HEAL, KINE, PHED, PRLS, SPMT, SRST and TOUR in the Courses chapter of this catalog. Additional courses in Physical Activity and Sports are offered for elective credit to George Mason University students. These courses are included under PHED and PRLS prefixes.

Writing-Intensive Requirement

The university requires all undergraduate students to successfully complete at least one 300-level or above course designated “writing-intensive” (WI) in their major(s). For RHT students, the WI requirement is satisfied by the successful completion of PRLS 450 and/or PHED 365, dependent on program requirements.

Interdisciplinary Minors

In addition to school-based minors, RHT offers three minors in interdisciplinary areas of study. These minors require course work from two or more disciplines and are administered by interunit faculty groups. In accordance with university policy, at least 8 credits must be applied only to the minor and may not fulfill requirements of the student's major concentration, or another minor. For policies governing all minors, see the Academic Policies chapter of this catalog chapter of this catalog.

Minor in Sport Communication

The Sport Communication Minor is offered jointly by the School of Recreation, Health, and Tourism and the Department of Communication. For details, see the Department of Communication section in the College of Humanities and Social Sciences chapter of this catalog.

Minor in Sustainability

The Sustainability Minor is offered jointly by the Department of Environmental Science and Policy and New Century College. Students may take select Parks, Recreation and Leisure Studies (PRLS) and Tourism and Events Management (TEM) courses to meet elective requirements. For details, see the Department of Environmental Science and Policy section in the College of Science chapter of this catalog.

Minor in Sport and American Culture

The Sport and American Culture Minor is offered jointly by the School of Recreation, Health, and Tourism and Department of History and Art History. Students will learn a great deal about sport and its interconnection with other societal institutions. For details, see the School Recreation, Health, and Tourism website: http://rht.gmu.edu/programs/minor7/

Complementary Certificate Programs

Students may also complete a complementary certificate outside of RHT in the following areas:

Environmental Management Undergraduate Certificate

For details on this 27-credit undergraduate certificate (SC-CERB-EVMG), see the Department of Environmental Science and Policy section of the College of Science chapter of this catalog.
Note: Students interested in the certificate in Environmental Management should take BIOL 213 and either BIOL 303 or BIOL 304 instead of BIOL 103 and 104.

Physical Activity and Sports Courses

RHT courses in physical activity and sports provide a broad range of opportunities that promote the health and wellness of students, faculty, and staff. Taught by experts with a wealth of experience and commitment to sharing their knowledge and skills, the courses include individual and team sports, self-defense and martial arts, and recreation activities concerned with wilderness and outdoor pursuits. Open to students in any major, these courses are designed to foster educational growth, encourage leisure interests, and promote lifetime fitness for the entire Mason community.

PHED 102 - Introduction to Soccer Credits: 1
PHED 103 - Fencing I Credits: 1
PHED 105 - Aerobics and Basic Conditioning Credits: 1
PHED 107 - Social Dance Credits: 1
PHED 108 - Weight Training and Body Conditioning Credits: 1
PHED 110 - Beginning Swimming Credits: 1
PHED 113 - Latin Dance Credits: 1
PHED 118 - Advanced Life Guarding Credits: 1
PHED 120 - Introduction to Basketball Credits: 1
PHED 127 - Social Dance II Credits: 1
PHED 128 - Fencing II Credits: 2
PHED 129 - Introduction to Yoga Credits: 1
PHED 130 - Intermediate Yoga Credits: 1
PHED 131 - Introduction to Pilates Credits: 1
PHED 134 - Self-Defense for Men and Women Credits: 1
PHED 135 - Self-Defense for Men and Women II Credits: 1
PHED 136 - Tae Kwon Do Credits: 1
PHED 137 - Intermediate Tae Kwon Do Credits: 1
PHED 138 - Brazilian Jiu-Jitsu Credits: 1
PHED 139 - Brazilian Jiu-Jitsu II for Men and Women Credits: 2
PHED 140 - Golf Credits: 1
PHED 144 - Intermediate Golf Credits: 2
PHED 145 - Beginning Judo for Men and Women Credits: 1
PHED 146 - Introduction to Badminton Credits: 1
PHED 147 - Advanced Tae Kwon Do Credits: 2
PHED 149 - Tai Chi Credits: 1
PHED 150 - Intermediate Swimming Credits: 1
PHED 151 - Introduction to Tennis Credits: 1
PHED 153 - Intermediate Tennis Credits: 1
PHED 155 - Introduction to Springboard Diving Credits: 2
PHED 156 - Intermediate Springboard Diving Credits: 2
PHED 157 - Aikido for Men and Women Credits: 1
PHED 158 - Underwater Hockey Credits: 1
PHED 159 - Advanced Swimming Credits: 1
PHED 160 - Intermediate Tai Chi Credits: 1
PHED 162 - Introduction to Bowling Credits: 1
PHED 163 - Karate Credits: 1
PHED 164 - Intermediate Karate Credits: 1
PHED 165 - Introduction to Racquetball Credits: 1
PHED 166 - Intermediate Racquetball Credits: 1
PHED 167 - Advanced Concepts and Strategies in Bowling Credits: 1
PHED 169 - Intermediate Judo for Men/Women Credits: 2
PHED 250 - Water Safety Instruction Credits: 2
PHED 255 - Basic Scuba Diving Credits: 2
PRLS 110 - Exploring Outdoor Adventure Credits: 2
PRLS 115 - Introduction to Fly Fishing Credits: 1
PRLS 116 - Introduction to Indoor Rock Climbing Credits: 1
PRLS 117 - Rock Climbing Credits: 2
PRLS 118 - Intermediate Rock Climbing Credits: 2
PRLS 119 - Trap and Skeet Shooting Credits: 2
PRLS 120 - Introduction to Backpacking Credits: 2
PRLS 121 - Intermediate Trap and Skeet Shooting Credits: 2
PRLS 122 - Introduction to Horsemanship Credits: 1
PRLS 123 - Intermediate Indoor Rock Climbing Credits: 1
PRLS 124 - Pistol Marksmanship Credits: 2
PRLS 170 - Introduction to White-water Kayaking Credits: 1
PRLS 173 - Basic Coastal Kayaking Credits: 2
PRLS 174 - Open Water Coastal Kayaking Credits: 2
PRLS 175 - Introduction to Rowing Credits: 1
PRLS 180 - White-water Canoeing Credits: 2
PRLS 181 - White-water Canoeing II Credits: 2
PRLS 190 - Downhill Skiing Credits: 1
PRLS 191 - Snowboarding Credits: 1
PRLS 195 - Introduction to Hot Air Ballooning Credits: 2
PRLS 250 - Wilderness Travel and Sustainability Credits: 2
PRLS 253 - Florida Everglades Canoe Expedition Credits: 3

Undergraduate Degree

Athletic Training, BS

Banner Code: E1-BS-ATT

This 123-credit degree provides educational and clinical experiences concerning the management of injuries and health problems associated with physical activity. The goal is to equip students with the knowledge and skills that must be mastered to successfully prepare for the Board of Certification (BOC®) Examination and practice as an entry-level athletic trainer. The Athletic Training Education Program (ATEP) is divided into pre-professional and professional phases. Students begin the pre-professional phase upon admission to Mason by enrolling in required prerequisite courses (ATEP 150, ATEP 180, BIOL 124, BIOL 125, HEAL 110, HEAL 230, and ATEP 300).

Upon successful completion of all pre-professional course work with a grade of C or higher and a minimum cumulative GPA of 2.8, students may advance into the professional phase (three levels) of the program. Professional phase levels I-III require concurrent enrollment in didactic, clinical techniques, and practicum clinical education courses. The professional phase requires satisfactory completion of prerequisites, attainment of a grade of C or higher in all ATEP required course work, a minimum cumulative within-major GPA of 2.8, and maintenance of current Emergency Cardiac Care (ECC) and First Aid certifications.

For policies governing all undergraduate degrees, see the Academic Policies section of the catalog. Students should also review the section on University General Education requirements.

Application Process

Freshmen Applications
Admission to George Mason University is competitive, and successful candidates generally have a B+ average or higher in a challenging college preparatory curriculum. All students accepted to George Mason University and declaring athletic training as a major are admitted into the pre-professional phase of the program (typically freshmen). Freshmen are bound to university admissions criteria as stated in the university catalog. To progress into the professional phase of the program, students must earn a minimum grade of C in all within-major courses (ATEP 150, ATEP 180, BIOL 124, BIOL 125, HEAL 110, HEAL 230, ATEP 300) and attain a cumulative minimum within-major GPA of 2.8 or greater.

Transfer Student Applications

Application for admission as a transfer student into the ATEP is competitive. Transfer applicants are evaluated based on satisfactory completion of standards identical to all other students enrolled in the ATEP. Students transferring from another institution must provide documentation of successful completion of all ATEP-related course work with a grade of C or higher, a cumulative within-major GPA of 2.8 or higher on a 4.0 scale, and related clinical education/experiences. Additional documentation includes transcripts, course syllabi, a letter from the ATEP director of the previous institution certifying satisfactory completion of all clinical experiences, completed proficiency assessments signed and dated by an approved clinical instructor attained at the previous institution, and current Emergency Cardiac Care (ECC) and First Aid certifications. Students unable to provide this documentation will not be admitted into the professional phase of the ATEP. All transfer students are advised to meet with the ATEP Director for an evaluation of all previously completed course work.

Special Requirements

Fees and expenses specific to the ATEP are as follows: laboratory supplies and equipment, clinical attire, clinical supplies, and clinical education manuals. Pre-professional phase students enrolling in ATEP 150 and ATEP 180 will be assessed a laboratory fee $110. Professional phase students will be assessed a laboratory fee of $100 for each clinical techniques course (ATEP 255, ATEP 265, ATEP 355, and ATEP 365). Payment is due at the first meeting of each course.

After admission to the pre-professional phase, students must submit a technical standards certification statement indicating that they have read, understand, and can meet the technical standards for athletic training students, either with or without accommodation. These standards outline the essential functional tasks that students must be able to perform to enroll in and complete the program. Students requiring special accommodations are encouraged to contact the Office of Disability Services.

Athletic training students are required to obtain a health examination and immunizations before entering the professional phase of the program. Students must have evidence of completion of the three hepatitis B immunizations and provide proof of tuberculosis screening in accordance with current U.S. Public Health Service recommendations. Students will be responsible for any costs associated with such screenings. Students choosing not to complete hepatitis B immunizations will be required to sign a declination waiver. All professional phase students must complete annual blood-borne pathogens training offered in the practicum courses. Students may be required to undergo a criminal background check. If a criminal background check fails to meet the requirements of a student's assigned practicum site, the student will be withdrawn from the practicum site and may be prohibited from completion of the curriculum. Students are encouraged to disclose any criminal background incidences to the ATEP Director prior to practicum placement. All students must have Emergency Cardiac Care (CPR, AED) and First Aid certifications before entering their first practicum experience and must maintain these certifications through the remainder of the ATEP. For additional information about ATEP academic policies and procedures refer to the program handbook at http://rht.gmu.edu/atep/forms/

It is the responsibility of professional phase ATEP students to arrange transportation to and from their assigned practicum course sites. It is recommended that students have personal transportation. A limited number of sites are accessible via public transportation from the Fairfax campus. In the case that a practicum site is not accessible by public transportation and the student does not have a car, it is suggested the student take public transportation as far as possible and then take a taxi to the site. The student is responsible for all transportation fees including but not limited to gas, parking, bus, metro, taxi and zip car expenses. Students that have financial difficulty are encouraged to meet with a financial aid advisor to seek additional assistance.

Degree Requirements
General Education Requirements (38 credits)

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  Must take STAT 250
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral sciences (3)
  Must take HEAL 230
- Global understanding (3)
- Natural science (8)
  Must take BIOL 124 and BIOL 125

Pre-Professional Phase (13 credits)

Students begin the pre-professional phase upon admission to Mason by enrolling in the seven required prerequisite courses below. Upon successful completion of all pre-professional course work with a grade of C or higher and a minimum cumulative GPA of 2.8, students may advance into the professional phase (three levels) of the program.

- ATEP 150 - Introduction to Athletic Training and Preventative Care Techniques Credits: 3 Fall/Spring Semester
- ATEP 180 - Emergency Medical Care for Physically Active Populations Credits: 0-4 Spring Semester (Must register for 4 credits)
- ATEP 300 - Functional Anatomy Credits: 3 Fall/Spring/Summer Semester
- HEAL 110 - Personal Health Credits: 3 Fall/Spring Semester

The following required pre-professional courses satisfy (and are listed with) General Education requirements. They are therefore not included in the total pre-professional credit count.

- BIOL 124 - Human Anatomy and Physiology Credits: 4 Fall/Spring Semester
- BIOL 125 - Human Anatomy and Physiology Credits: 4 Spring/Summer Semester
- HEAL 230 - Introduction to Health Behavior Credits: 3 Fall/Spring Semester

Professional Phase (66 credits)

Professional phase levels I-III require concurrent enrollment in didactic, clinical techniques, and practicum clinical education courses. The professional phase requires satisfactory completion of prerequisites, attainment of a grade of C or higher in all ATEP required course work, a minimum cumulative within-major GPA of 2.8, and maintenance of current Emergency Cardiac Care (ECC) and First Aid certifications.

Professional Courses (Level I) (24 credits)

- ATEP 250 - Physical Assessment of the Lower Body Credits: 3 * Fall Semester
- ATEP 255 - Clinical Techniques I: Physical Assessment of the Lower Body Credits: 3 * Fall Semester
• ATEP 256 - Practicum I: Physical Assessment of the Lower Body Credits: 3 * Fall Semester
• ATEP 260 - Physical Assessment of the Upper Body Credits: 3 * Spring Semester
• ATEP 265 - Clinical Techniques II: Physical Assessment of the Upper Body Credits: 3 * Spring Semester
• ATEP 266 - Practicum II: Physical Assessment of the Upper Body Credits: 3 * Spring Semester
• ATEP 270 - General Medical Conditions and Pharmacology in Physically Active Populations Credits: 3 Spring Semester
• HEAL 330 - Nutrition Credits: 3 Fall Semester

Professional Courses (Level II) (21 credits)

• ATEP 350 - Therapeutic Modalities Credits: 3 * Fall Semester
• ATEP 355 - Clinical Techniques III: Therapeutic Modalities Credits: 3 * Fall Semester
• ATEP 356 - Practicum III: Therapeutic Modalities Credits: 3 * Fall Semester
• ATEP 360 - Therapeutic Rehabilitation Credits: 3 * Spring Semester
• ATEP 365 - Clinical Techniques IV: Therapeutic Rehabilitation Credits: 3 * Spring Semester
• ATEP 366 - Practicum IV: Therapeutic Rehabilitation Credits: 3 * Spring Semester
• KINE 310 - Exercise Physiology I Credits: 3 * Fall Semester

Professional Courses (Level III) (21 credits)

• ATEP 441 - Senior Seminar in Athletic Training Credits: 3 Fall/Spring Semester *
• ATEP 450 - Administration and Management in Athletic Training Credits: 3 * Fall Semester
• ATEP 456 - Practicum V: Professional Integration Credits: 6 * Fall Semester
• PHED 364 - Strength Training: Concepts and Applications Credits: 3 Fall Semester
• PRLS 450 - Research Methods Credits: 3 Fall Semester (Satisfies the university Writing Intensive requirement)
• PRLS 460 - Sport and Recreation Law Credits: 3 Fall/Spring Semester

Notes

All courses marked with an * must be taken concurrently in the semester they are offered. Practicum courses require a clinical education field experience component.

Electives (6 credits)

Choose an additional 6 credits from the university catalog

Total: 123 credits

Health, Fitness, and Recreation Resources, BS
This 120-credit degree allows students to specialize in one of five varied concentrations (Health Promotion, Kinesiology, Parks and Outdoor Recreation, Sport Management, and Therapeutic Recreation).

For policies governing all undergraduate degrees, see the Academic Policies section of the catalog. Students should also review the section on University General Education requirements.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

Internship Application

The internship is a 12-credit capstone course taken at the end of a student’s academic program. Students must have earned 90 credit hours and met the specific prerequisites for their concentration to be eligible for the internship (see HEAL 490, KNES 490, PRLS 490, and SPMT 490). The internship is designed to be a synthesis experience for each student in his or her specific concentration area.

The internship process begins with a required in-service hosted by the internship coordinator. During the preliminary phase students will develop learning goals and consult with faculty on viable internship sites. Once the internship site has been selected, the student must complete 400 hours of an applied experience in their field of study. Therapeutic Recreation (TR) requires a 560-hour, fourteen consecutive week field placement experience in therapeutic recreation services that uses the therapeutic recreation process.

Throughout the internship for all programs, the student will be monitored by a site supervisor (a Certified Therapeutic Recreation Specialist for therapeutic recreation), as well as a university supervisor, to facilitate a meaningful experience. For specific internship requirements, see the School of Recreation, Health and Tourism (RHT) Internship Manual.

Degree Requirements

▲ Concentration in Health Promotion (HPR)

This concentration prepares students for supervisory and managerial careers in voluntary health organizations, non-profit and managed care organizations, hospital wellness centers, health departments, and health clubs. Students complete course work in nutrition, contemporary health problems, and community health systems, as well as a supervised internship in a professional setting.

Course Work

General Education Requirements (38 credits)

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  Must take STAT 250
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral science (3)
- Global understanding (3)
- Natural science (8)
  Must take BIOL 124 and BIOL 125

Professional Sequence (70 credits)

- HEAL 205 - Principles of Accident Causation and Prevention Credits: 4
- HEAL 220 - Dimensions of Mental Health Credits: 3
- HEAL 230 - Introduction to Health Behavior Credits: 3 *
- HEAL 314 - Community Health Issues and Strategies Credits: 3
- HEAL 323 - Program Leadership and Evaluation Credits: 3
- HEAL 330 - Nutrition Credits: 3
- HEAL 350 - Interventions for Populations and Communities at Risk Credits: 3 **
- HEAL 372 - Health Communication Credits: 3
- HEAL 430 - Seminar in Exercise Science and Health Promotion Credits: 3
- HEAL 450 - Epidemiology and Environmental Health Credits: 3
- HEAL 490 - Internship Credits: 12
- PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
- PHED 365 - Measurement and Evaluation of Physical Fitness Credits: 3 (Satisfies the university Writing Intensive requirement)
- PRLS 310 - Program Planning and Design Credits: 3
- PRLS 410 - Administration of RHT Organizations I Credits: 3
- PRLS 411 - Administration of RHT Organizations II Credits: 3
- PRLS 450 - Research Methods Credits: 3 (Satisfies the university Writing Intensive requirement)
- PRLS 460 - Sport and Recreation Law Credits: 3

Choose 6 credits from the following:

- ATEP 150 - Introduction to Athletic Training and Preventative Care Techniques Credits: 3
- ATEP 180 - Emergency Medical Care for Physically Active Populations Credits: 0-4
- HEAL 310 - Drugs and Health Credits: 3
- HEAL 312 - Health and Wellness Choices Credits: 3
- HEAL 325 - Health Aspects of Human Sexuality Credits: 3
- HEAL 327 - Women's Health Credits: 3
- KINE 350 - Exercise Prescription and Programming Credits: 3
- KINE 360 - Strength Training: Concepts and Applications Credits: 3
  or
- PHED 364 - Strength Training: Concepts and Applications Credits: 3

Notes:
Electives (12)

Choose an additional 12 credits from the university catalog

Total: 120 credits

▲ Concentration in Kinesiology (KNES)

This 75-credit concentration in Kinesiology can prepare students for a career in clinical exercise, coaching, corporate fitness, medical and exercise equipment sales, mind-body studies, pharmaceutical sales, personal training, sport and exercise nutrition, sport science, or wellness/fitness management. The KNES program provides students with a strong science foundation for postgraduate specialized study in kinesiology or professional schools (e.g., chiropractic, medical, physical therapy).

Students are expected to maintain a minimum cumulative GPA of 2.5 and receive a grade of C or better in BIOL 124, BIOL 125, HEAL 230, and STAT 250 as well as all Professional Sequence courses. Failure to do so will result in probation or dismissal from the KNES program.

Special Requirements

Fees and expenses specific to students enrolled in the KNES program are as follows: laboratory supplies and equipment, clinical supplies, and internship attire. Students enrolled in KINE 350, KINE 400, and KINE 410 will be assessed a $25.00 laboratory fee for each course during the semester in which they are enrolled. Payment is to be rendered at the first meeting of each course. Checks are to be made payable to George Mason University.

Course Work

General Education Requirements (38 credits)

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  Must take STAT 250
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral sciences (3)
  Must take HEAL 230
- Global understanding (3)
- Natural science (8)
  Must take BIOL 124 and BIOL 125

Professional Sequence (75 credits)
• ATEP 300 - Functional Anatomy Credits: 3
• HEAL 110 - Personal Health Credits: 3
• HEAL 205 - Principles of Accident Causation and Prevention Credits: 4
• HEAL 330 - Nutrition Credits: 3
• KINE 100 - Introduction to Kinesiology Credits: 3
• KINE 200 - Principles of Health Related Fitness Credits: 2
• KINE 310 - Exercise Physiology I Credits: 3
• KINE 330 - Seminar in Kinesiology Credits: 3
• KINE 341 - Kinesiology Internship I Credits: 3
• KINE 350 - Exercise Prescription and Programming Credits: 3
• KINE 360 - Strength Training: Concepts and Applications Credits: 3
• KINE 370 - Measurement and Evaluation of Physical Fitness Credits: 3
• KINE 380 - Exercise Prescription and Programming for Special Populations Credits: 3
• KINE 400 - Biomechanics Credits: 3
• KINE 410 - Exercise Physiology II Credits: 3
• KINE 420 - Sport and Exercise Nutrition Credits: 3
• KINE 441 - Kinesiology Internship II Credits: 3
• KINE 490 - Kinesiology Internship III Credits: 12
• PRLS 405 - Planning, Design, and Maintenance of Leisure Facilities Credits: 3
• PRLS 450 - Research Methods Credits: 3 (Satisfies the university Writing Intensive requirement)
• PRLS 460 - Sport and Recreation Law Credits: 3
• SPMT 320 - Psychology of Sport Credits: 3

Electives (7)

Choose an additional 7 credits from the university catalog

Total: 120 credits

▲ Concentration in Parks and Outdoor Recreation (POR)

This concentration explores the contribution of recreation and parks to public well-being and quality of life. The curriculum includes courses in natural resources management, outdoor recreation programming, and environmental education. The program is accredited by the Council on Accreditation of Parks, Recreation, Tourism and Related Professions. Graduates are employed in national, state, and local recreation and park agencies, non-profit organizations, and private and commercial operations. Students complete both a supervised practicum and internship in professional settings.

Course Work

General Education Requirements (38 credits)

• Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  Must take STAT 250
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral science (3)
- Global understanding (3)
- Natural science (8)

**Professional Sequence (70 credits)**

- HEAL 205 - Principles of Accident Causation and Prevention Credits: 4
- HEAL 323 - Program Leadership and Evaluation Credits: 3
- PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
- PRLS 210 - Introduction to Recreation and Leisure Credits: 3
- PRLS 241 - Practicum Credits: 3
- PRLS 300 - People with Nature Credits: 3
- PRLS 302 - Park Management and Operations Credits: 3
- PRLS 310 - Program Planning and Design Credits: 3
- PRLS 316 - Outdoor Education and Leadership Credits: 3
- PRLS 317 - Social Psychology of Play and Recreation Credits: 3
- PRLS 327 - Foundations of Therapeutic Recreation Credits: 3
- PRLS 362 - Cultural and Environmental Interpretation Credits: 3
- PRLS 402 - Human Behavior in Natural Environments Credits: 3
- PRLS 405 - Planning, Design, and Maintenance of Leisure Facilities Credits: 3
- PRLS 410 - Administration of RHT Organizations I Credits: 3
- PRLS 411 - Administration of RHT Organizations II Credits: 3
- PRLS 450 - Research Methods Credits: 3 (Satisfies the university Writing Intensive requirement)
- PRLS 460 - Sport and Recreation Law Credits: 3
- PRLS 490 - Internship Credits: 12-15 (Must register for 12 credits)
- PRLS 501 - Introduction to Natural Resources Law Credits: 3

**Electives (12)**

Choose an additional 12 credits from the university catalog

**Total: 120 credits**

▲ **Concentration in Sport Management (SPMT)**

This concentration enhances the professional development of liberal arts-educated students, thereby preparing them to assume entry-level managerial positions in the $300 billion sport industry, including private enterprises, government or public
employment sectors, nonprofit or voluntary agencies, and commercial sport ventures. Preparation in sport marketing, finance, ethics, law, operations, planning, and program leadership fosters the skills that enhance students’ acquisition and advancement in sport management careers. An integral part of the program is the opportunity to complete two field experiences in sport organizations.

Course Work

General Education Requirements (37 credits)

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  Must take STAT 250
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral science (3)
- Global understanding (3)
- Natural science (7)

Professional Sequence (66 credits)

- HEAL 323 - Program Leadership and Evaluation Credits: 3
- PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
- PRLS 310 - Program Planning and Design Credits: 3
- PRLS 410 - Administration of RHT Organizations I Credits: 3
- PRLS 450 - Research Methods Credits: 3  (Satisfies the university Writing Intensive requirement)
- PRLS 460 - Sport and Recreation Law Credits: 3
- SPMT 201 - Introduction to Sport Management Credits: 3
- SPMT 241 - Practicum Credits: 3
- SPMT 302 - Sport and Ethics Credits: 3
- SPMT 304 - Sport, Culture, and Society Credits: 3
- SPMT 320 - Psychology of Sport Credits: 3
- SPMT 405 - Sport Operation and Planning Credits: 3
- SPMT 412 - Sport Marketing and Finance Credits: 3
- SPMT 420 - Economics and Finance in the Sport Industry Credits: 3
- SPMT 430 - Sport Communication Credits: 3
- SPMT 440 - Global Perspectives in Sport Credits: 3
- SPMT 455 - Governance and Policy in Sport Organizations Credits: 3
- SPMT 475 - Sport Management Professional Development Seminar Credits: 3
- SPMT 490 - Internship Credits: 9-12 (Must register for 12 credits)

Electives (17)

Choose an additional 17 credits from the university catalog
Total: 120 credits

▲ Concentration in Therapeutic Recreation (TR)

This concentration teaches students how to use activities as therapeutic tools toward a renewed quality of life for people with disabilities across the lifespan. Completion of the therapeutic recreation (TR) foundation, issues, processes, and assessment courses to name a few, as well as an internship supervised by a Certified Therapeutic Recreation Specialist, prepares graduating seniors to sit for the national exam sponsored by the National Council for Therapeutic Recreation Certification. The concentration is accredited by the Council on Accreditation of Parks, Recreation, Tourism and Related Professions. Graduates find employment in local, state, and federal recreation settings; senior and adult health care; non-profit organizations; and educational and clinical institutions.

Course Work

General Education Requirements (38 credits)

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  Must take STAT 250
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral science (3)
  Must take PSYC 100
- Global understanding (3)
- Natural science (8)
  Must take BIOL 124 and BIOL 125

Professional Sequence (73 credits)

- HEAL 205 - Principles of Accident Causation and Prevention Credits: 4
- HEAL 323 - Program Leadership and Evaluation Credits: 3
- PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
- PRLS 210 - Introduction to Recreation and Leisure Credits: 3
- PRLS 241 - Practicum Credits: 3
- PRLS 310 - Program Planning and Design Credits: 3
- PRLS 316 - Outdoor Education and Leadership Credits: 3
- PRLS 317 - Social Psychology of Play and Recreation Credits: 3
- PRLS 327 - Foundations of Therapeutic Recreation Credits: 3
- PRLS 405 - Planning, Design, and Maintenance of Leisure Facilities Credits: 3
- PRLS 410 - Administration of RHT Organizations I Credits: 3
- PRLS 411 - Administration of RHT Organizations II Credits: 3
- PRLS 416 - Trends and Programming Assessment in Therapeutic Recreation Credits: 3
- PRLS 417 - Processes, Techniques and Supervision in Therapeutic Recreation Credits: 3
- PRLS 418 - Assessment in Therapeutic Recreation Credits: 3
- PRLS 450 - Research Methods Credits: 3 (Satisfies the university Writing Intensive requirement)
- PRLS 460 - Sport and Recreation Law Credits: 3
- PRLS 490 - Internship Credits: 12-15 (Must register for 12 credits)
- PRLS 503 - Administration and Disability Rights in Therapeutic Recreation Credits: 3
- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 325 - Abnormal Psychology Credits: 3

Electives (9)

Choose an additional 9 credits from the university catalog

Total: 120 credits

**Physical Education, BSEd**

**Banner Code: E1-BSED-PHED**

This 120-credit degree program is accredited by the National Council for Accreditation of Teacher Education (NCATE). Completing this degree fulfills requirements for licensure in Health and Physical Education (PK-12) in Virginia. Students complete a student teaching experience in their final semester.

For policies governing all undergraduate degrees, see the Academic Policies section of the catalog. Students should also review the section on University General Education requirements.

**Student Teaching Internship**

To enroll in PHED 415 - Student Teaching in Physical Education, physical education majors must have a minimum 2.50 GPA in the last 60 credits of course work; submit copies of official passing scores for the VCLA and PRAXIS II exams; and have satisfactorily completed all required general education and professional concentration courses. The application must be completed one full semester before taking PHED 415 - Student Teaching in Physical Education. Application deadlines are listed below and forms are located at [rht.gmu.edu/phed/student_teaching](http://rht.gmu.edu/phed/student_teaching).

**Student Teaching Internship Application Deadlines:**

Fall Semester—February 1  
Spring Semester—September 1

**Admission**

Four-year students: Students entering as freshmen with an interest in majoring in physical education will initially be accepted with BPRE (pre-PHED) status. Students must successfully complete a minimum of 45 credits and attain a cumulative GPA of
2.50 to apply to the BSED in Physical Education Program. In addition, students must submit passing Praxis I scores or its approved substitutes, and have earned passing grades in BIOL 124, BIOL 125, PHED 201, and PHED 202.

Degree-seeking transfer students: Transfer students can apply for BSED status by having (1) a minimum of 45 credits from their previous institution with a cumulative GPA of 2.50 or by completing 12 credits at Mason with a minimum of a 2.50 GPA; (2) submitted passing scores for PRAXIS I or its approved substitutes; and (3) passed BIOL 124 and BIOL 125, and PHED 201 and PHED 202 (only a grade of C or higher is accepted for BIOL 141 and BIOL 142, if transferred from a Virginia Community College System (VCCS) institution).

Degree Requirements

Course Work

General Education Requirements (38 credits)

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral science (3)
- Global understanding (3)
- Natural science (8)
	no grade of C or higher is accepted for BIOL 141 and BIOL 142, if transferred from a Virginia Community College System (VCCS) institution).

Professional Sequence (82 credits)

- ATEP 300 - Functional Anatomy Credits: 3
- EDRD 300 - Literacy and Curriculum Integration Credits: 3
- HEAL 110 - Personal Health Credits: 3
- HEAL 205 - Principles of Accident Causation and Prevention Credits: 4
- HEAL 220 - Dimensions of Mental Health Credits: 3
- HEAL 310 - Drugs and Health Credits: 3
- HEAL 325 - Health Aspects of Human Sexuality Credits: 3
- HEAL 330 - Nutrition Credits: 3
- HEAL 405 - Teaching Methods in Health Education (K-12) Credits: 3
- KINE 200 - Principles of Health Related Fitness Credits: 2
- KINE 310 - Exercise Physiology I Credits: 3

- PHED 110 - Beginning Swimming Credits: 1

or
• PHED 150 - Intermediate Swimming Credits: 1 
  or 
• PHED 159 - Advanced Swimming Credits: 1

• PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
• PHED 201 - Developmental Motor Patterns Credits: 3
• PHED 202 - Teaching Skillful Movement Credits: 3
• PHED 273 - Net and Target Games Credits: 2
• PHED 274 - Dance and Educational Gymnastics Credits: 2
• PHED 275 - Field and Invasion Games Credits: 2
• PHED 306 - Psychomotor Learning Credits: 3
• PHED 308 - Adapted Physical Education Credits: 3
• PHED 340 - Social and Cultural Issues in Physical Education Credits: 3  (Satisfies the university Writing Intensive requirement)
• PHED 403 - Elementary School Instruction in Physical Education Credits: 3
• PHED 404 - Middle and High School Instruction in Physical Education Credits: 3
• PHED 415 - Student Teaching in Physical Education Credits: 9-12  (take 12 credits)
• PRLS 316 - Outdoor Education and Leadership Credits: 3
• PRLS 460 - Sport and Recreation Law Credits: 3

Note:

Students are not permitted to enroll in HEAL 405, PHED 308, PHED 403, PHED 404, and PHED 415, until they have met all BSEd application requirements.

Additionally, students will be expected to achieve and maintain the healthy zone of health related fitness as measured by FitnessGram® throughout their program. Accommodations will be made for students with documented physical disabilities.

Total: 120 credits

Tourism and Events Management, BS

Banner Code: E1-BS-TEM

This 120-credit degree program prepares students to enter a diverse profession in the world’s third-largest industry. Built on the curricula cornerstones of resort management, environmental tourism, events management, and cultural and heritage tourism, courses equip students with knowledge, skills, and experience in managing the tourism experience for the benefit of the traveler, host, and supporting industry. Graduates are employed in commercial, private, and public agencies, and in a wide variety of jobs and many geographic or business settings. A minor is available.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

For policies governing all undergraduate degrees, see the Academic Policies section of the catalog. Students should also review the section on University General Education requirements.

Degree Requirements
Concentration in Events Management (EVNM)

Course Work

General Education Requirements (37 credits)

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  Must take STAT 250
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral science (3)
- Global understanding (3)
- Natural science (7)

Professional Sequence (71 credits)

- PRLS 310 - Program Planning and Design Credits: 3
- PRLS 410 - Administration of RHT Organizations I Credits: 3
- PRLS 450 - Research Methods Credits: 3 (Satisfies the university Writing Intensive requirement)
- PRLS 460 - Sport and Recreation Law Credits: 3
- TOUR 110 - Professionalism and Civility Credits: 1
- TOUR 200 - Introduction to Travel and Tourism Credits: 3
- TOUR 220 - Introduction to Event Management Credits: 3
- TOUR 230 - Introduction to Hospitality Management Credits: 3
- TOUR 241 - Practicum Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3
- TOUR 412 - Tourism and Events Marketing Credits: 3
- TOUR 414 - Tourism and Events Finance Credits: 3
- TOUR 470 - Senior Seminar Credits: 1
- TOUR 490 - Internship Credits: 12

Choose eight courses (24 credits) from the following:
- HEAL 323 - Program Leadership and Evaluation Credits: 3
- PRLS 362 - Cultural and Environmental Interpretation Credits: 3
- TOUR 190 - Wedding Planning Credits: 3
- TOUR 221 - Event Implementation and Evaluation Credits: 3
- TOUR 320 - Hospitality Management Information Systems Credits: 3
- TOUR 330 - Resort Management Credits: 3
- TOUR 352 - Heritage and Cultural Tourism Credits: 3
- TOUR 416 - Hospitality Sales Credits: 3
- TOUR 420 - Tourism Planning/Policy Credits: 3
- TOUR 440 - Meetings and Conventions Credits: 3
- TOUR 450 - Hospitality Human Resources Management Credits: 3
- TOUR 480 - Special Topics Credits: 1-3
- TOUR 499 - Independent Study Credits: 1-3

Notes:

TOUR 210 and TOUR 311 may not be used to satisfy both degree and general education requirements.

TOUR 499 must be approved by department.

**Electives (12 credits)**

Choose an additional 12 credits from the university catalog

**Total: 120 credits**

▲ **Concentration in Hospitality Management (HPTM)**

**Course Work**

**General Education Requirements (37 credits)**

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  - Must take STAT 250
- Literature (3)
- Arts (3)
• Western civilization (3)
• Social and behavioral science (3)
• Global understanding (3)
• Natural science (7)

Professional Sequence (71 credits)

• PRLS 310 - Program Planning and Design Credits: 3
• PRLS 410 - Administration of RHT Organizations I Credits: 3
• PRLS 450 - Research Methods Credits: 3 (Satisfies the university Writing Intensive requirement)
• PRLS 460 - Sport and Recreation Law Credits: 3
• TOUR 110 - Professionalism and Civility Credits: 1
• TOUR 200 - Introduction to Travel and Tourism Credits: 3
• TOUR 220 - Introduction to Event Management Credits: 3
• TOUR 230 - Introduction to Hospitality Management Credits: 3
• TOUR 241 - Practicum Credits: 3
• TOUR 340 - Sustainable Tourism Credits: 3
• TOUR 412 - Tourism and Events Marketing Credits: 3
• TOUR 414 - Tourism and Events Finance Credits: 3
• TOUR 470 - Senior Seminar Credits: 1
• TOUR 490 - Internship Credits: 12

Choose eight courses (24 credits) from the following:

• TOUR 190 - Wedding Planning Credits: 3
• TOUR 301 - Hotel Management Credits: 3
• TOUR 310 - Food and Beverage Management Credits: 3
• TOUR 320 - Hospitality Management Information Systems Credits: 3
• TOUR 330 - Resort Management Credits: 3
• TOUR 416 - Hospitality Sales Credits: 3
• TOUR 418 - Hospitality Accounting Credits: 3
• TOUR 440 - Meetings and Conventions Credits: 3
• TOUR 450 - Hospitality Human Resources Management Credits: 3
• TOUR 460 - Hospitality Facilities Operations Credits: 3
• TOUR 480 - Special Topics Credits: 1-3
• TOUR 499 - Independent Study Credits: 1-3

Notes:

TOUR 210 and TOUR 311 may not be used to satisfy both degree and general education requirements.

TOUR 499 must be approved by department.
Electives (12 credits)

Choose an additional 12 credits from the university catalog

Total: 120 credits

▲ Concentration in Tourism Management (TRSM)

Course Work

General Education Requirements (37 credits)

- Written communication (6)
- Oral communication (3)
- Information technology (3)
- Quantitative reasoning (3)
  Must take STAT 250
- Literature (3)
- Arts (3)
- Western civilization (3)
- Social and behavioral science (3)
- Global understanding (3)
- Natural science (7)

Professional Sequence (71 credits)

- PRLS 310 - Program Planning and Design Credits: 3
- PRLS 410 - Administration of RHT Organizations I Credits: 3
- PRLS 450 - Research Methods Credits: 3 (Satisfies the university Writing Intensive requirement)
- PRLS 460 - Sport and Recreation Law Credits: 3
- TOUR 110 - Professionalism and Civility Credits: 1
- TOUR 200 - Introduction to Travel and Tourism Credits: 3
- TOUR 220 - Introduction to Event Management Credits: 3
- TOUR 230 - Introduction to Hospitality Management Credits: 3
- TOUR 241 - Practicum Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3
- TOUR 412 - Tourism and Events Marketing Credits: 3
- TOUR 414 - Tourism and Events Finance Credits: 3
- TOUR 470 - Senior Seminar Credits: 1
• TOUR 490 - Internship Credits: 12

Choose eight courses (24 credits) from the following:

• PRLS 362 - Cultural and Environmental Interpretation Credits: 3
• TOUR 311 - Women and Tourism Credits: 3
• TOUR 312 - Ecotourism Credits: 3
• TOUR 320 - Hospitality Management Information Systems Credits: 3
• TOUR 330 - Resort Management Credits: 3
• TOUR 352 - Heritage and Cultural Tourism Credits: 3
• TOUR 416 - Hospitality Sales Credits: 3
• TOUR 420 - Tourism Planning/Policy Credits: 3
• TOUR 440 - Meetings and Conventions Credits: 3
• TOUR 450 - Hospitality Human Resources Management Credits: 3
• TOUR 480 - Special Topics Credits: 1-3
• TOUR 499 - Independent Study Credits: 1-3

Notes:

TOUR 210 and TOUR 311 may not be used to satisfy both degree and general education requirements.

TOUR 499 must be approved by department.

Electives (12 credits)

Choose an additional 12 credits from the university catalog

Total: 120 credits

Bachelor's Level Certificate

Outdoor Recreation and Experiential Leadership Undergraduate Certificate

Banner Code: E1-CERB-OREL

This 25-credit certificate program provides any interested individual with specialized skills unique to a variety of outdoor adventure and experiential activities, such as backpacking, rock climbing, canoeing, kayaking, and challenge-course facilitation. Course work focuses on the acquisition of technical skills and application of theory-to-experiential learning in an outdoor recreation curriculum. The program provides options to attain certification as low and high element facilitators and Wilderness First Responders. Students completing the certificate requirements will be fully prepared to work as challenge course facilitators,
work as instructors at Outdoor Education/Adventure Education organizations, and effectively integrate outdoor experiential programs with existing educational curricula.

Certificate Requirements

Required Core Courses (17 credits)

- NCLC 204 - Leadership Theory and Practice Credits: 3
- PRLS 110 - Exploring Outdoor Adventure Credits: 2
- PRLS 210 - Introduction to Recreation and Leisure Credits: 3
- PRLS 220 - Experiential Education Theory and Application Credits: 3
- PRLS 221 - Challenge Course Facilitation Credits: 3
- PRLS 316 - Outdoor Education and Leadership Credits: 3

Electives (8 credits)

Choose 8 credits from the following:

- NCLC 195 - Field-Based Work Credits: 1-6 (must register for 1 credit)
- PRLS 117 - Rock Climbing Credits: 2
- PRLS 120 - Introduction to Backpacking Credits: 2
- PRLS 170 - Introduction to White-water Kayaking Credits: 2
- PRLS 173 - Basic Coastal Kayaking Credits: 2
- PRLS 180 - White-water Canoeing Credits: 2
- PRLS 181 - White-water Canoeing II Credits: 2
- PRLS 200 - Wilderness First Responder Credits: 2
- PRLS 250 - Wilderness Travel and Sustainability Credits: 2
- PRLS 480 - Special Topics in Parks, Recreation, and Leisure Studies Credits: 1-3

Total: 25 credits

Undergraduate Minor

Health Promotion Minor

Banner Code: HPR
This program of study is offered by the College of Education and Human Development, specifically the School of Recreation, Health, and Tourism.

This 18-credit minor is available to all Mason undergraduate students, with the exception of those enrolled in the BS in Health, Fitness, and Recreation Resources degree program pursuing the Concentration in Health Promotion. Eight credits must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

**Course Work**

- HEAL 230 - Introduction to Health Behavior Credits: 3
- HEAL 372 - Health Communication Credits: 3
- HEAL 430 - Seminar in Exercise Science and Health Promotion Credits: 3
- HEAL 450 - Epidemiology and Environmental Health Credits: 3
- PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
- PRLS 310 - Program Planning and Design Credits: 3

**Total: 18 credits**

**Kinesiology Minor**

**Banner Code: KNES**

This program of study is offered by the College of Education and Human Development, specifically the School of Recreation, Health, and Tourism.

This 18-credit minor is available to all Mason undergraduate students, with the exception of those enrolled in the BS in Health, Fitness, and Recreation Resources degree program and pursuing a concentration in Kinesiology. Eight credits must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

**Course Work**

Choose 18 credits from the following:

- ATEP 300 - Functional Anatomy Credits: 3
- HEAL 330 - Nutrition Credits: 3
- KINE 310 - Exercise Physiology I Credits: 3
- KINE 350 - Exercise Prescription and Programming Credits: 3
- KINE 360 - Strength Training: Concepts and Applications Credits: 3
- KINE 370 - Measurement and Evaluation of Physical Fitness Credits: 3
- KINE 400 - Biomechanics Credits: 3
- KINE 410 - Exercise Physiology II Credits: 3
- SPMT 320 - Psychology of Sport Credits: 3

**Total: 18 credits**
Parks, Recreation, and Leisure Studies Minor

Banner Code: PRLS

This program of study is offered by the College of Education and Human Development, specifically the School of Recreation, Health, and Tourism.

This 18-credit minor (including a practicum) is available to all Mason undergraduate students, with the exception of those enrolled in the BS in Health, Fitness, and Recreation Resources degree program pursuing a concentration in Parks and Outdoor Recreation or Therapeutic Recreation. Eight credits must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

Course Work

- PRLS 210 - Introduction to Recreation and Leisure Credits: 3
- PRLS 241 - Practicum Credits: 3
- PRLS 310 - Program Planning and Design Credits: 3
- PRLS 316 - Outdoor Education and Leadership Credits: 3
- PRLS 327 - Foundations of Therapeutic Recreation Credits: 3
- PRLS 410 - Administration of RHT Organizations I Credits: 3

Note:

Students must complete PRLS 210, PRLS 310, PRLS 316, PRLS 327, and PRLS 410 before taking PRLS 241. PRLS 241 and PRLS 410 may be taken concurrently.

Total: 18 credits

Sport and American Culture Minor

Banner Code: SAMC

This program of study is offered by the College of Education and Human Development, specifically the School of Recreation, Health, and Tourism.

This 18-credit interdisciplinary minor is offered jointly by the School of Recreation, Health, and Tourism and the Department of History and Art History. Students must take two required and four elective courses (two from Sport Management and two from History). This minor is available to all Mason undergraduate students. Eight credits must be unique to the minor.

Course Work

- HIST 341 - History of Sport in the United States Credits: 3
- SPMT 304 - Sport, Culture, and Society Credits: 3
Electives (Sport Management)

Choose two courses (6 credits) from the following:

- SPMT 321 - America Through Baseball Credits: 3
- SPMT 322 - Football and American Culture Credits: 3
- SPMT 323 - America and the Modern Olympics Credits: 3

Electives (History)

Choose two courses (6 credits) from the following:

- HIST 337 - Race and Gender in American Sports Credits: 3
- HIST 338 - History of College Athletics Credits: 3
- HIST 339 - History of Baseball Credits: 3

Total: 18 credits

Sport Management Minor

Banner Code: SPMT

This program of study is offered by the College of Education and Human Development, specifically the School of Recreation, Health, and Tourism.

This 18-credit minor is available to all Mason undergraduate students, with the exception of those enrolled in the BS in Health, Fitness, and Recreation Resources degree program and pursuing a concentration in Sport Management. Eight credits must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

Course Work

- SPMT 201 - Introduction to Sport Management Credits: 3
- SPMT 420 - Economics and Finance in the Sport Industry Credits: 3
- SPMT 455 - Governance and Policy in Sport Organizations Credits: 3
  Choose three from the following:
- PRLS 410 - Administration of RHT Organizations I Credits: 3
- PRLS 460 - Sport and Recreation Law Credits: 3
- SPMT 302 - Sport and Ethics Credits: 3
- SPMT 304 - Sport, Culture, and Society Credits: 3
- SPMT 405 - Sport Operation and Planning Credits: 3
- SPMT 412 - Sport Marketing and Finance Credits: 3
- SPMT 430 - Sport Communication Credits: 3
- SPMT 440 - Global Perspectives in Sport Credits: 3
- SPMT 480 - Special Topics in Sport Management Credits: 3

Total: 18 credits

Tourism and Events Management Minor

Banner Code: TEM

This program of study is offered by the College of Education and Human Development, specifically the School of Recreation, Health, and Tourism.

This 15-credit minor is available to all Mason undergraduate students, with the exception of those enrolled in the BS in Tourism and Events Management degree program. Eight credits must be unique to the minor. For requirements governing all minors, see the Academic Policies section of this catalog.

Course Work

- TOUR 200 - Introduction to Travel and Tourism Credits: 3
- TOUR 220 - Introduction to Event Management Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3

Electives

Choose six additional credits from TOUR-prefix courses

Total: 15 credits

Master's Degree

Exercise, Fitness, and Health Promotion, MS

Banner Code: E1-MS-EFHP

This 36-credit master's of science degree in Exercise, Fitness, and Health Promotion takes a science-based approach toward the fields of athletic training, biomechanics, and strength and conditioning. This degree prepares students to become professionals capable of applying evidenced-based scientific principles. Completion of this degree prepares students for employment in human performance and allied health related professions or the pursuit of further academic study (doctoral programs). This program offers the traditional research masters' thesis or a research project option.

This program of study is offered by the School of Recreation, Health, and Tourism (RHT) within the College of Education and Human Development.
For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

In addition to fulfilling admission requirements for graduate study, applicants must hold a baccalaureate degree in a discipline related to the field of kinesiology, exercise science, or athletic training. All applicants are required to submit results of the Graduate Record Examination (GRE); three letters of reference (two from professors); resume; official transcripts; and a 500 word statement outlining their background and experience and future career goals. Successful applicants have a minimum overall undergraduate GPA of 3.0. Admission to the graduate programs is competitive. Meeting the minimum admission criteria does not guarantee admission. Successful completion of an undergraduate course in statistics and physics is strongly recommended.

Course Work

All students are required to complete core courses. Students must also complete elective courses and a capstone thesis or research project.

Required Courses (15 credits)

- EFHP 610 - Advanced Exercise Physiology Credits: 3
- EFHP 612 - Scientific Foundation of Applied Kinesiology Credits: 3
- EFHP 613 - Advanced Applied Biomechanics Credits: 3
- EFHP 620 - Research Methods for Applied Kinesiology Credits: 3
- EFHP 621 - Statistical Methods for Applied Kinesiology Credits: 3

Electives (15 credits)

Students must choose 9 EFHP elective credits. Students must choose 6 additional graduate credits with Program Coordinator approval:

- EFHP 522 - Anatomy for the Athletic Trainer: Structure and Function of the Neuromuscular and Musculoskeletal Systems Credits: 3
- EFHP 524 - Physiology for the Athletic Trainer Including the Pharmacology of Sports Injuries Credits: 3
- EFHP 526 - Athletic Training Perspectives: Evaluation and Prevention of Sports Injuries Credits: 3
- EFHP 528 - Advanced Athletic Training Credits: 3
- EFHP 599 - Independent Study EFHP Credits: 1-3
- EFHP 611 - Fitness Assessment: Theory and Practice Credits: 3
- EFHP 614 - Advanced Exercise Nutrition Credits: 3
- EFHP 616 - Motor Behavior and Development Credits: 3
- EFHP 618 - Exercise and Sport Psychology Credits: 3
- EFHP 630 - Exercise, Health, and Fitness Program Development Credits: 3
- EFHP 650 - Scientific Principles of Motor Learning Credits: 3
- EFHP 660 - Management of Exercise, Fitness, and Health Promotion Organizations Credits: 3
- EFHP 680 - Ethical Issues in Exercise, Fitness, and Health Promotion Credits: 3
Thesis or Project (6 credits)

- EFHP 598 - Special Topics Credits: 1-6 (Must register for 3 credits)
- EFHP 798 - Project Credits: 1-3 (Must register for 3 credits)
  or
- EFHP 799 - Thesis Credits: 1-6 (Must register for 3 credits)

Note:

The EFHP Graduate coordinator will appoint the student an advisor from among the EFHP graduate faculty to supervise thesis and research project work. In consultation with the advisor the student will select two additional faculty members to form a three-member committee. One committee member may be selected from faculty outside of the program. Students may not register for thesis credit until a proposal has been approved by the student’s thesis committee and the EFHP Graduate Coordinator.

Total: 36 credits

Sport and Recreation Studies, MS

Banner Code: E1-MS-SRST

This 30-credit master of science in Sport and Recreation Studies (SRST), consisting of five concentrations, meets the growing need for professionals and academics in the areas of international sport management, recreation administration, sport and leisure studies, sport coaching, and sport management. This degree prepares students as professionals who will more adequately serve the industry and their communities, and students who wish to pursue advanced study through doctoral programs in these disciplinary areas, leading to employment (and contributions) in academe. This program offers the traditional research masters' thesis option and the option of an applied research project linked to a professional setting or internship.

This program of study is offered by the School of Recreation, Health, and Tourism (RHT) within the College of Education and Human Development

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

In addition to fulfilling admission requirements for graduate study, applicants must have successfully completed an undergraduate course in statistics. All applicants are required to submit results of the Graduate Record Examination (GRE) (unless a graduate of Mason) or Miller Analogy Test (MAT); three letters of reference (two from professors); official transcripts; and a 500-1,000 word statement outlining their background and experience and future goals in International Sport Management, Recreation Administration, Sport and Leisure Studies, Sport Coaching, and Sport Management. Applicants without a sport, leisure, or recreation-related degree must indicate through the written statement and letters of recommendation how their academic and/or professional background prepares them for admission to the Sport and Recreation Studies graduate program.
Successful applicants have an overall GPA of 3.0 for the last 60 undergraduate credits; generally a minimum GPA 3.25 in undergraduate courses, and combined scores of 900 or above on the GRE. Admission to the graduate programs in RHT is competitive. Meeting the minimum admission criteria does not guarantee admission.

Degree Requirements

MS Core Course Work (15 credits)

Students are required to take a set of core foundations courses that will provide grounding in historical and socio-cultural foundations, ethical and legal issues, social-psychological perspectives, management and administration, and research methods and statistics. As well, all students will complete a capstone thesis or project specific to their concentration.

- **Historical and Socio-Cultural Foundations**
  - SRST 606 - Foundations of Sport and Recreation Studies Credits: 3

- **Ethical and Legal Issues**
  Choose one course from the following:
  - EFHP 680 - Ethical Issues in Exercise, Fitness, and Health Promotion Credits: 3
  - PRLS 614 - Legal Issues in Recreation Administration Credits: 3
  - PRLS 670 - Environmental Law Credits: 3
  - SPMT 614 - Legal Issues in Sport Credits: 3

- **Social-Psychological Perspectives**
  - EFHP 618 - Exercise and Sport Psychology Credits: 3
  or
  - PRLS 611 - Social Psychology of Leisure Credits: 3

- **Management and Administration**
  - PRLS 610 - Recreation Administration and Planning Credits: 3
  or
  - SPMT 612 - Economics and Financial Management in the Sport Industry Credits: 3

- **Research Methods and Statistics**
  - SRST 623 - Research Design and Statistical Reasoning Credits: 3

▲ Concentration in International Sport Management (ISPM)

**Course Work**

Choose 9 credits from the following:

- SPMT 551 - Sport in the Global Marketplace Credits: 3
- SPMT 555 - The Australian Model of Sport Credits: 3
- SPMT 556 - The Global Soccer Industry Credits: 3
SPMT 651 - Sport and International Development Credits: 3
SPMT 652 - Governance and Policy in International Sport Credits: 3
SRST 598 - Special Topics Credits: 1-6
Note: Additional courses may be selected as electives with advisor approval

Thesis or Project

SRST 599 - Independent Study in Sport and Recreation Studies Credits: 1-3 (must register for 3 credits)
SRST 798 - Master’s Project Credits: 1-3 (must register for 3 credits)
or
SRST 799 - Master’s Thesis Credits: 1-6 (must register for 3 credits)

Total: 15 credits

▲ Concentration in Recreation Administration (RADM)

Course Work

PRLS 531 - Natural Resources Recreation Planning Credits: 3
PRLS 533 - Visitor Services Credits: 3
PRLS 535 - Evaluating Recreation Outcomes Credits: 3
PRLS 598 - Special Topics Credits: 1-6
PRLS 599 - Independent Study Credits: 1-3
PRLS 601 - History of Leisure and Sport in American Society Credits: 3
PRLS 612 - Philosophy of Leisure and Sport Credits: 3
Note: Additional courses may be selected as electives with advisor approval

Thesis or Project

SRST 599 - Independent Study in Sport and Recreation Studies Credits: 1-3 (must register for 3 credits)
SRST 798 - Master’s Project Credits: 1-3 (must register for 3 credits)
or
SRST 799 - Master’s Thesis Credits: 1-6 (must register for 3 credits)
Total: 15 credits

▲ Concentration in Sport and Leisure Studies (SPLS)

Course Work

- PRLS 612 - Philosophy of Leisure and Sport Credits: 3
- PRLS 598 - Special Topics Credits: 1-6
- PRLS 599 - Independent Study Credits: 1-3
- PRLS 601 - History of Leisure and Sport in American Society Credits: 3
- SPMT 551 - Sport in the Global Marketplace Credits: 3
- SPMT 651 - Sport and International Development Credits: 3

Note:
Additional courses may be selected as electives with advisor approval

Thesis or Project

- SRST 599 - Independent Study in Sport and Recreation Studies Credits: 1-3 (must register for 3 credits)
- SRST 798 - Master’s Project Credits: 1-3 (must register for 3 credits)
  or
- SRST 799 - Master’s Thesis Credits: 1-6 (must register for 3 credits)

Total: 15 credits

▲ Concentration in Sport Coaching (SPTC)

Course Work

- EFHP 611 - Fitness Assessment: Theory and Practice Credits: 3
- SPMT 614 - Legal Issues in Sport Credits: 3
- SPMT 631 - Theoretical Models of Sport Coaching Credits: 3
  Note: Students in this concentration must complete both EFHP 680 (within the MS requirements) and SPMT 614 (within this concentration)

Thesis or Project

- SRST 599 - Independent Study in Sport and Recreation Studies Credits: 1-3 (must register for 3 credits)
- SRST 798 - Master's Project Credits: 1-3 (must register for 3 credits)
  or
- SRST 799 - Master's Thesis Credits: 1-6 (must register for 3 credits)

Total: 15 credits

▲ Concentration in Sport Management (SPMT)

Course Work

- SPMT 611 - Sport Marketing and Sales Credits: 3
- SPMT 613 - Strategic Leadership in Sport Organizations Credits: 3
  Choose one course from the following:
  - EFHP 660 - Management of Exercise, Fitness, and Health Promotion Organizations Credits: 3
  - EFHP 680 - Ethical Issues in Exercise, Fitness, and Health Promotion Credits: 3
  - SPMT 616 - Sport Operations, Venues, and Event Management Credits: 3
  - SRST 598 - Special Topics Credits: 1-6
  Note: Additional courses may be selected as electives with advisor approval

Thesis or Project

- SRST 599 - Independent Study in Sport and Recreation Studies Credits: 1-3 (must register for 3 credits)
- SRST 798 - Master’s Project Credits: 1-3 (must register for 3 credits)
  or
- SRST 799 - Master’s Thesis Credits: 1-6 (must register for 3 credits)
Total: 15 credits

Total: 30 credits

Other Programs

Physical Activity and Sports Courses

Our courses in physical activity and sports provide a broad range of opportunities that promote the health and wellness of students, faculty, and staff. Taught by experts with a wealth of experience and commitment to sharing their knowledge and skills, the courses include more traditional individual and dual sports, self-defense and martial arts, and recreation activities concerned with wilderness and outdoor pursuits. Open to students in any major, these courses are designed to foster educational growth, encourage leisure interests, and promote lifetime fitness for the entire Mason community.

■ Graduate School of Education

Phone: 703-993-2892
Web: cehd.gmu.edu

The Graduate School of Education (GSE) offers one doctoral degree, six master's degrees, eight minors, and 25 graduate certificates. Within each of these degree programs students have the option to choose a concentration that best meets their interests or needs. Additionally, students may pursue course work leading to initial teacher licensure.

Faculty

Professors: Behrmann, Bemak, Brozo, Clark, R. Chung, Dabbagh, Dimitrov, Earley, Galluzzo, Haley, Kelly, King-Sears, Kitsantas, Mastropieri, Maxwell, Ndura-Ouedraogo, Norton, Samaras, Schrum, Scruggs, Shaklee, Sterling, Sturtevant

Associate professors: Annetta, Bannan, Bauer, Bon, Brazer, Brigham, Buehl, Burns, DeMulder, Fox, Frazier, Grant, Hjalmanson, Kalbfleisch, Kayler, Kidd, Nasser, Ndura, Osterling, Pierce, Razeghi, Reybold, Sanchez, R. Smith, Spencer, Sprague, Talleyrand, Thomas, Thorp, Upperman, Wong, Zenkov


Instructors: D. Fulcher, Rioux-Bailey

Course Work
GSE offers course work designated ECED, EDCD, EDCI, EDEP, EDIT, EDLE, EDRD, EDRS, EDSE, and EDUC in the Courses chapter of this catalog. Students can pursue a Master's degree and up to two graduate certificates concurrently.

**Collaborative Undergraduate Degree Licensure Programs**

GSE supports undergraduate students from a variety of disciplines interested in education and teacher licensure. Seven collaborative undergraduate degree licensure programs are available. For more information, contact the GSE Undergraduate Academic Advisor at 703-993-2078, usie@gmu.edu, or visit usie.gmu.edu.

**Dance Arts Licensure (PK–12)**

Upon successful completion of the requirements for a BA or BFA in Dance, students may pursue course work that will allow them to attain licensure to teach dance in Virginia public school systems. For details, see the Department of Dance section in the College of Visual and Performing Arts chapter of this catalog.

**Theatre Arts Licensure (PK–12)**

Upon successful completion of the requirements for a BA in Theater with a concentration in Theater Education for Theatre Arts Pk-12, students may pursue course work that will allow them to attain licensure to teach Theatre Arts in Virginia public school systems. For details, see the Department of Theater section in the College of Visual and Performing Arts chapter of this catalog.

**Concentration in Biology Education**

Upon successful completion of the BA in Biology or the BS in Biology with a concentration in Biology Education, students can obtain licensure to teach biology in Virginia public school systems. For details, see the Biology Undergraduate Program and the Department of Environmental Science and Policy’s (ESP) collaborative Biology program section in the College of Science chapter of this catalog.

**Concentration in Chemistry Education**

The BS in Chemistry with a concentration in Chemistry Education allows students to obtain licensure to teach chemistry in Virginia public school systems. For details, see the Department of Chemistry and Biochemistry section in the College of Science chapter of this catalog.

**Concentration in Earth Science Education**

The BS in Earth Science with a concentration in Earth Science Education allows students to obtain licensure to teach earth science in Virginia public school systems. For details, see the Department of Atmospheric, Oceanic and Earth Sciences section in the College of Science chapter of this catalog.

**Concentration in Mathematics Education**

Upon successful completion of the BA in Mathematics or the BS in Mathematics with a concentration in Mathematics Education, students can obtain licensure to teach mathematics in Virginia Public school systems. For details, see the Department of Mathematical Science section in the College of Science chapter of this catalog.

**Concentration in Music Education (PK–12)**
The BM in Music with a concentration in Music Education allows students to obtain certification to teach in Virginia public school systems. Students may follow an instrumental or choral/general music emphasis in the curriculum. For details, see the Department of Music section in the College of Visual and Performing Arts chapter of this catalog.

**Emphasis in Physics Education**

The BS in Physics with an emphasis in Physics Education allows students to obtain licensure to teach high school physics in Virginia public school systems. For details, see the School of Physics, Astronomy, and Computational Sciences section in the College of Science chapter of this catalog.

**Collaborative Graduate Degree Licensure Programs**

**Concentration in School Psychology**

Upon successful completion of the MA in Psychology with a concentration in School Psychology and the School Psychology Graduate Certificate, students can obtain licensure to work as a School Psychologist in Virginia public school systems. For details, see the Department of Psychology section in the College of Humanities and Social Sciences chapter of this catalog.

**Theatre Arts Licensure (PK-12)**

Upon successful completion of the requirements for a Teaching Theatre Arts PK-12 Graduate Certificate, students can obtain licensure to teach Theatre in Virginia public school systems. For details, see the Department of Theater section in the College of Visual and Performing Arts chapter of this catalog.

**Visual Arts Licensure (PK-12)**

Upon successful completion of the requirements for an Art Education Graduate Certificate, students can obtain licensure to teach Art in Virginia public school systems. For details, see the School of Art section in the College of Visual and Performing Arts chapter of this catalog.

**Paul D. Coverdell Fellows and Master's International Programs (MIP)**

The FAST TRAIN (The Foreign Affairs' Spouses Teacher Training) Program is an approved site for the Paul D. Coverdell Fellows and Master's International Programs. While FAST TRAIN has traditionally prepared teachers for international service, it has entered into an agreement with the Peace Corps to offer the Paul D. Coverdell Fellows Program which trains returning volunteers to teach Elementary Education or English as a Second Language (ESL) in multicultural settings in the Washington, D.C. metro area. FAST TRAIN also participates in the Peace Corps Master's International Program that prepares outgoing volunteers for their ESL teaching assignments abroad as well as provides a program for completion of English as a Second Language (ESL) licensure and a MEd in Curriculum and Instruction.

**Undergraduate Minor**

**Applied Behavior Analysis Minor**

*Banner Code: ABAC*
This program of study is offered by the College of Education and Human Development, specifically the Graduate School of Education.

This 18-credit minor provides undergraduate students with the coursework and experience required by the Behavior Analyst Certification Board to sit for the Board Certified Assistant Behavior Analyst examination. Nine credit hours are distributed across three required courses and the remaining nine across the required practicum.

**Course Work**

- EDSE 460 - Introduction to Applied Behavior Analysis Credits: 3
- EDSE 461 - Analysis and Intervention in Applied Behavior Analysis Credits: 3
- EDSE 462 - Applying Behavior Analysis in School and Community Settings Credits: 3
- EDSE 490 - Internship in Applied Behavior Analysis Credits: 3-9 (must register for 9 credits)

**Total: 18 credits**

**Assistive Technology Minor**

**Banner Code: AT**

This program of study is offered by the College of Education and Human Development, specifically the Graduate School of Education.

This 15-credit minor provides undergraduate students with background knowledge in assistive technology. Eight credits of coursework must be unique to the minor.

**Course Work**

- EDIT 410 - Introduction to Assistive Technology Credits: 3
- EDIT 423 - Accessibility/Input Modifications Credits: 2
- EDUC 203 - Human Disabilities in American Culture Credits: 3

**Electives**

Choose 7 credits from the following:

- EDIT 412 - Assistive Technology for Individuals with Sensory Impairments Credits: 2
- EDIT 425 - Software for Individuals with Special Needs Credits: 2
- EDIT 426 - Web Accessibility and Design Credits: 3
- EDIT 428 - Low-Technology Assistive Technology Solutions Credits: 1
- EDSE 422 - Augmentative Communication Credits: 2
Total: 15 credits

Early Childhood Education for Diverse Learners Minor

Banner Code: ECDL

This program of study is offered by the College of Education and Human Development, specifically the Graduate School of Education.

This 15-credit minor provides undergraduate students with background knowledge in Early Childhood Education for Diverse Learners. Completing this minor partially fulfills requirements for licensure in Early Childhood Education, PK-3 and Early Childhood Special Education in Virginia. Eight credits of course work must be unique to the minor.

Course Work

- ECED 401 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3
- ECED 402 - Foundations of Language and Literacy for Diverse Young Learners Credits: 3
- ECED 403 - Inclusive Curriculum for Young Learners: Planning Instruction and Guidance Credits: 3
- ECED 405 - Introduction to Early Childhood Special Education Credits: 3
- Choose 3 credits from undergraduate ECED courses

Total: 15 credits

Education Studies Minor

Banner Code: ESTU

This program of study is offered by the College of Education and Human Development, specifically the Graduate School of Education.

This 18 or 19-credit minor is designed for students with a strong interest in exploring the field of education to develop a conceptual and situated understanding of schools and teaching. Eight credits of course work must be unique to the minor.

Course Work

- EDUC 300 - Introduction to Teaching Credits: 3
- SOCI 382 - Education in Contemporary Society Credits: 3

Electives
Choose four courses from the following:

- EDIT 413 - Technology, Society, and the Culture of Learning Credits: 3
- EDLE 412 - Schools and the Law Credits: 3
- EDLE 420 - Organization and Management of Schools Credits: 3
- EDUC 303 - Politics of American Education Credits: 3
- NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-6 (Must register for 3 credits)
  or
- NCLC 316 - Introduction to Childhood Studies Credits: 4

Total: 18 or 19 credits

**Mild Disabilities Minor**

Banner Code: MDIS

This program of study is offered by the College of Education and Human Development, specifically the Graduate School of Education.

This 15-credit minor provides undergraduate students with background knowledge in mild disabilities. Completing this minor partially fulfills requirements for licensure in Special Education in Virginia. Eight credits of course work must be unique to the minor.

**Course Work**

- EDSE 401 - Introduction to Special Education Credits: 3
- EDSE 402 - Classroom Management and Applied Behavior Analysis Credits: 3
- EDSE 403 - Language Development and Reading Credits: 3
- EDSE 428 - Elementary Reading, Curriculum, and Strategies for Students Who Access the General Education Curriculum Credits: 3
- EDSE 440 - Characteristics of Students with Disabilities Who Access the General Curriculum Credits: 3

Total: 15 credits

**Secondary Education English Minor**

Banner Code: SECE

This program of study is offered by the College of Education and Human Development, specifically the Graduate School of Education.
This 21-credit minor provides undergraduates with background knowledge in Secondary Education English. Completing this minor fulfills requirements for licensure in Secondary Education English (6-12) in Virginia. Eight credits of course work must be unique to the minor. Individuals must be formally admitted to this program to begin the course sequence.

**Course Work**

- EDCI 469 - Teaching English in Secondary School Credits: 3
- EDCI 479 - Advanced Methods of Teaching English in the Secondary School Credits: 3
- EDCI 490 - Student Teaching in Education Credits: 6
- EDRD 419 - Literacy in the Content Areas Credits: 3
- EDUC 372 - Human Development, Learning, and Teaching Credits: 3
- EDUC 422 - Foundations of Secondary Education Credits: 3

Total: 21 credits

**Severe Disabilities Minor**

**Banner Code: SPSD**

This program of study is offered by the College of Education and Human Development, specifically the Graduate School of Education.

This 15-credit minor provides undergraduate students with background knowledge in severe disabilities. Completing this minor partially fulfills requirements for licensure in Special Education in Virginia. Eight credits of course work must be unique to the minor.

**Course Work**

- EDSE 401 - Introduction to Special Education Credits: 3
- EDSE 431 - Transition and Community-Based Instruction Credits: 3
- EDSE 434 - Communication and Severe Disabilities Credits: 3
- EDSE 447 - Medical and Developmental Risk Factors for Children with Disabilities Credits: 3
- EDSE 457 - Foundations of Language and Literacy for Diverse Learners Credits: 3

Total: 15 credits

**Visual Impairment and Blindness Minor**

**Banner Code: VISB**
This 17-credit minor provides undergraduate students with background knowledge in teaching students with visual impairments. Completing this minor partially fulfills requirements for licensure in Special Education in Virginia. Eight credits of course work must be unique to the minor.

Course Work

- EDSE 401 - Introduction to Special Education Credits: 3
- EDSE 411 - Characteristics of Students with Visual Impairments Credits: 1
- EDSE 412 - Braille Code Credits: 3
- EDSE 414 - Orientation and Mobility Credits: 2
- EDSE 418 - Curriculum and Assessment of Students with Visual Impairments Credits: 3
- EDSE 422 - Augmentative Communication Credits: 2
- EDSE 432 - Positive Behavior Supports Credits: 3

Total: 17 credits

Master's Degree

Counseling and Development, MEd

Banner Code: E1-MED-CNDV

This master’s program emphasizes the integration of theory and practice, and culminates with an internship in an appropriate setting. Students may choose one of two concentrations: Community Agency Counseling (52 credits) or School Counseling (45 credits).

Grading Policy

Students enrolled in this degree program must earn a B or higher in Counseling skills courses (EDCD 603, EDCD 606, EDCD 608, EDCD 609, EDCD 755) and in all licensure course work. Students are permitted to repeat a course only once.

▲ Concentration in Community Agency Counseling (CA)

Course Work

- EDCD 609 - Advanced Counseling Skills and Strategies Credits: 4
- EDCD 652 - Introduction to Substance Abuse Counseling Credits: 3
- EDCD 654 - Counseling, Ethics, and Consultation in Community Agencies Credits: 3
- EDCD 656 - Diagnosis and Treatment Planning for Mental Health Professionals Credits: 3
• EDCD 658 - Couples and Family Counseling Credits: 3
• EDCD 797 - Advanced Topics in Education Credits: 1-6 (Must register for 2 credits)

MEd Requirements (28 credits)

• EDCD 525 - Advanced Human Growth and Development Credits: 3
• EDCD 601 - Introduction to Research in Counseling Credits: 3
• EDCD 602 - Foundations in Counseling Credits: 3
• EDCD 603 - Counseling Theories and Practice Credits: 3
• EDCD 604 - Assessment and Appraisal in Counseling Credits: 3
• EDCD 608 - Group Processes and Analyses Credits: 4
• EDCD 610 - Career and Educational Counseling Credits: 3
• EDCD 628 - Counseling and Social Justice Credits: 3
• EDCD 660 - Multicultural Counseling Credits: 3

Practicum and Internship (6 credits)

• EDCD 755 - Practicum in Counseling Credits: 3
• EDCD 791 - Internship in Counseling Credits: 3

Total: 52 credits

▲ Concentration in School Counseling PK–12 (SC)

Course Work

• EDCD 606 - Counseling Children and Adolescents Credits: 4
• EDCD 611 - Introduction to Ethical and Legal Issues in School Counseling Credits: 2
• EDCD 626 - Principles and Practices of School Counseling Credits: 3
• EDCD 797 - Advanced Topics in Education Credits: 1-6 (Must register for 2 credits)

MEd Requirements (28 credits)

• EDCD 525 - Advanced Human Growth and Development Credits: 3
• EDCD 601 - Introduction to Research in Counseling Credits: 3
• EDCD 602 - Foundations in Counseling Credits: 3
• EDCD 603 - Counseling Theories and Practice Credits: 3
• EDCD 604 - Assessment and Appraisal in Counseling Credits: 3
• EDCD 608 - Group Processes and Analyses Credits: 4
• EDCD 610 - Career and Educational Counseling Credits: 3
• EDCD 628 - Counseling and Social Justice Credits: 3
• EDCD 660 - Multicultural Counseling Credits: 3

Practicum and Internship (6 credits)

• EDCD 755 - Practicum in Counseling Credits: 3
• EDCD 791 - Internship in Counseling Credits: 3

Total: 45 credits

Curriculum and Instruction, MEd

Banner Code: E1-MED-CRIN

This master’s degree is offered to students preparing for initial teacher licensure, advanced teacher education, and ancillary educational programs.

Coursework

Each concentration description wholly describes the requirements for the degree and concentration.

Students may choose up to two of the following concentrations:

Advanced Studies in Teaching and Learning (ASTL)

Concentration in ASTL: Advanced International Baccalaureate (AIB)
Concentration in ASTL: Art Education (AART)
Concentration in ASTL: Early Childhood Education (AECE)
Concentration in ASTL: Elementary Mathematics (AEMA)
Concentration in ASTL: Foreign Language French (AFLF)
Concentration in ASTL: Foreign Language Spanish (AFLS)
Concentration in ASTL: Geography (AGEO)
Concentration in Gifted Child Education (AGCE)
Concentration in ASTL: History (AHIS)
Concentration in ASTL: Individualized (AATL)
Concentration in ASTL: PK–12 Classroom Teachers (AP12)
Concentration in ASTL: Literacy: Reading Specialist (ALRS)
Concentration in ASTL: Mathematics (Middle and Secondary) (AMTH)
Concentration in ASTL: Physical Education (APED)
Concentration in ASTL: Science (ASCI)
Concentration in ASTL: Special Education (ASPE)
Concentration in ASTL: Teacher Leadership (ATL)
Early Childhood Education

Concentration in Early Childhood Education for Diverse Learners (ECDL)
Concentration in TFA- Early Childhood Education (Teach for America) (TECE)

Elementary Education

Concentration in Elementary Education (ELED)
Concentration in TFA- Elementary Education (Teach for America) (TEED)

Foreign Language

Concentration in English as a Second Language (PK-12)(CISL)
Concentration in Foreign Language: Arabic (EARB)
Concentration in Foreign Language: Chinese (ECHN)
Concentration in Foreign Language: French (EFRN)
Concentration in Foreign Language: German (EGRM)
Concentration in Foreign Language: Japanese (EJPN)
Concentration in Foreign Language: Latin (ELTN)
Concentration in Foreign Language: Russian (ERUS)
Concentration in Foreign Language: Spanish (ESPN)

Instructional Technology

Concentration in IT- Assistive and Special Education Technology (IASP)
Concentration in IT- Instructional Design and Development (IIDD)
Concentration in IT- Instructional Design and Development Immersion (IMDD)
Concentration in IT- Integration of Technology in Schools (IITS)

International Education

Concentration in International Education FAST TRAIN ESOL (PK-12) (FTSL)
Concentration in International Education FAST TRAIN (Elementary) PK-6 (FTEL)
Concentration in Multilingual and Multicultural Education (CIMM)

Secondary Education (6–12)

Concentration in Secondary Education Biology (SECB)
Concentration in Secondary Education Chemistry (SECC)
Concentration in Secondary Education Earth Science (SECS)
Concentration in Secondary Education English (SECE)
Concentration in Secondary Education History and Social Science (SECH)
Concentration in Secondary Education Mathematics (SECM)
Concentration in Secondary Education Physics (SECP)

Advanced Studies in Teaching and Learning (ASTL)

The ASTL concentrations are for teachers and other educators with one or more years of teaching or education-related experience who want to continue to grow professionally. The program offers advanced study in a specific concentration area, including Virginia’s Standards of Learning content areas, cohort classes, an innovative schedule, and the use of technology. The courses, aligned with the National Board for Professional Teaching Standards, help teachers think and practice as board-certified teachers. The program develops teacher-leaders who practice reflection through action-research, problem-based learning, and self-inquiry, and teacher expertise in a concentration that will identify the teacher as a potential leader in that area.

The program provides two options to experienced teachers and other educators. Educators with or without a master’s degree may apply for the full master’s degree program, which includes core and emphases, or an 18- to 21-credit graduate certificate program or advanced study in a particular area.

MEd Requirements Common to all ASTL Concentrations (12 credits)

- EDUC 606 - Education and Culture Credits: 3
- EDUC 612 - Inquiry into Practice Credits: 2
- EDUC 613 - How Students Learn Credits: 3
- EDUC 614 - Designing and Assessing Teaching and Learning Credits: 2
- EDUC 615 - Educational Change Credits: 2

▲Concentration in ASTL: Advanced International Baccalaureate (AIB)

This 18-credit International Baccalaureate(IB) concentration provides advanced professional development for teachers on the philosophy, elements, and assessments of the Primary Years Programme (PYP), Middle Years Programme (MYP), and Diploma Programme (DP). The course work focuses on the theory, pedagogy, and research under girding the International Baccalaureate programs.

Course Work

- EDUC 621 - Teaching and Learning in the International Baccalaureate Primary Years Program Credits: 3
- EDUC 622 - Curriculum Development across IB Programs Credits: 3
- EDUC 623 - Models and Strategies for Teaching and Learning in IB Schools Credits: 3
- EDUC 624 - Assessment and Learning in IB Schools Credits: 3
- EDUC 626 - Inquiry into Action: IB Teachers, Learners, and Schools Credits: 3
- EDUC 627 - Contemporary Issues and Trends in IB Credits: 3
Total: 18 credits

▲ Concentration in ASTL: Art Education (AART)

The 21-22 credit art education concentration is designed for art teachers with current licensure in art PK–12. It consists of six required courses and one elective course that address contemporary professional development content areas in art education.

Course Work

- AVT 605 - Issues and Research in Art Education Credits: 3
- AVT 606 - Creativity and Cognition in the Arts and Media Credits: 3
- AVT 615 - Technology for Art Teachers Credits: 3
- AVT 667 - Two-Dimensional Art Making: Form, Theme, and Context Credits: 3
- AVT 694 - Advanced Studies in Teaching Critical Response to Art, PK-12 Credits: 3
- AVT 697 - Advanced Strategies and Curricular Innovations in the Visual Arts Credits: 3

Electives

Choose one studio course from the following:

- AVT 668 - Three-Dimensional Art Making across Cultures Credits: 3
- AVT 669 - Four Dimensional Art Making: Technology and New Media Credits: 4

Note:

AVT 615 is a required 3-credit course. Qualified students who test out of this course are required to complete either AVT 668 or AVT 669.

Total: 21-22 credits

▲ Concentration in ASTL: Early Childhood Education (AECE)

The 18-credit early childhood concentration provides advanced professional development in preschool through third grade content and includes three required courses and three electives. The concentration focuses on practicing teachers who may or may not be licensed to teach young children.

Course Work

- EDCI 603 - Trends, Issues, and Research in Early Childhood Education Credits: 3
- EDCI 615 - Advanced Human Development Credits: 3
• EDCI 784 - Capstone Seminar in Early Childhood Education Credits: 3

Electives

Choose three courses from the following:

• EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
• EDCI 601 - Applied Study of Communicative Competence and Classroom Discourse Credits: 3
• EDCI 613 - Curriculum and Assessment in Early Childhood Education I Credits: 3
• EDCI 614 - Curriculum and Assessment in Early Childhood Education II Credits: 3
• EDCI 616 - The Creative Arts and Play in Early Childhood Education Credits: 3
• EDRD 630 - Advanced Literacy Foundations and Instruction, Birth to Middle Childhood Credits: 3
• EDSE 556 - Developing Language, Literacy, and Communication in Young Children Credits: 3
• EDSE 557 - Foundations of Language and Literacy for Diverse Learners Credits: 3
• EDSE 656 - Assessment of Diverse Young Learners Credits: 3
• EDSE 667 - Cognitive Development of Diverse Young Children Credits: 3

Total: 18 credits

▲ Concentration in ASTL: Elementary Mathematics (AEMA)

The 18-credit elementary math concentration combines the study of mathematics content appropriate for kindergarten through eighth grade with the study of mathematics education research, curriculum, leadership, and assessment.

Course Work

• MATH 610 - Number Systems and Number Theory for K-8 Teachers Credits: 3
• MATH 611 - Geometry and Measurement for K-8 Teachers Credits: 3
• MATH 612 - Probability and Statistics for K-8 Teachers Credits: 3
• MATH 613 - Algebra and Functions for K-8 Teachers Credits: 3
• MATH 614 - Rational Numbers and Proportional Reasoning for K-8 Teachers Credits: 3

Electives

Choose one 3-credit course from the following:

• EDCI 645 - Curriculum Development in Mathematics Education Credits: 3
• EDCI 646 - Mathematics Education Leadership for School Change Credits: 1-3 (Must register for 3 credits)
• EDCI 666 - Research in Mathematics Teaching Credits: 3

Total: 18 credits
Concentration in ASTL: Foreign Language French (AFLF)

The 18-credit foreign language concentration provides advanced professional development and language study for practicing foreign language teachers. The 18 credits include a combination of modern language courses and targeted electives.

Course Work

Literature

Choose 6 credits from the following:

- FREN 515 - Topics in Medieval French Literature and Culture Credits: 3
- FREN 517 - Topics in Seventeenth-Century French Literature and Culture Credits: 3
- FREN 518 - Topics in Eighteenth-Century French Literature and Culture Credits: 3
- FREN 519 - Topics in Nineteenth-Century French Literature and Culture Credits: 3
- FREN 550 - Special Topics Credits: 3

Note:

Courses may be substituted with advisor-approved literature-related electives in French.

Language and Linguistics

Take 6 credits:

- one advisor-approved 3 credit course in language and linguistics
- FREN 575 - Grammatical Analysis Credits: 3

Electives

Choose 6 credits in literature or language (select from courses listed above or below):

- FRLN 510 - Bibliography and Research in Foreign Languages and Literature Credits: 3
- FRLN 525 - Literary Translation Credits: 3
- FRLN 550 - Special Topics Credits: 3
- FRLN 565 - Theory of Translation Credits: 3
- FRLN 572 - Integrating Technology into Language Learning Credits: 3
- FRLN 573 - Basic Issues in Language Pedagogy Credits: 3
- FRLN 590 - Internship and Seminar in Translation Credits: 3
- FRLN 620 - Literary Theory and Criticism Credits: 3
- FRLN 660 - Approaches to the Study of Language Credits: 3
- FRLN 670 - Foreign Language Learning and Teaching Credits: 3
Note:

Courses may be substituted with advisor-approved language and literature-related electives.

Total: 18 credits

▲ Concentration in ASTL: Foreign Language Spanish (AFLS)

The 18-credit foreign language concentration provides advanced professional development and language study for practicing foreign language teachers. The 18 credits include a combination of modern language courses and targeted electives.

Course Work

- SPAN 502 - Hispanic Sociolinguistics Credits: 3
- SPAN 505 - Applied Spanish Stylistics Credits: 3
- SPAN 510 - Introduction to the Graduate Study of Literature in Spanish Credits: 3

Electives

Choose 9 credits from the following:

- FRLN 510 - Bibliography and Research in Foreign Languages and Literature Credits: 3
- FRLN 525 - Literary Translation Credits: 3
- FRLN 550 - Special Topics Credits: 3
- FRLN 565 - Theory of Translation Credits: 3
- FRLN 572 - Integrating Technology into Language Learning Credits: 3
- FRLN 573 - Basic Issues in Language Pedagogy Credits: 3
- FRLN 590 - Internship and Seminar in Translation Credits: 3
- FRLN 620 - Literary Theory and Criticism Credits: 3
- FRLN 650 - The Teaching of Culture in Foreign Language Programs Credits: 3
- FRLN 660 - Approaches to the Study of Language Credits: 3
- FRLN 670 - Foreign Language Learning and Teaching Credits: 3
- SPAN 501 - Applied Spanish Grammar Credits: 3
- SPAN 520 - Studies in Medieval Spanish Literature Credits: 3
- SPAN 525 - Studies in Renaissance Literature Credits: 3
- SPAN 530 - Studies in the Literature of the Golden Age Credits: 3
- SPAN 540 - Studies in 20th-Century Literature Credits: 3
- SPAN 545 - Studies in Hispanic Literature Credits: 3
- SPAN 551 - Special Topics in Spanish Credits: 3
- SPAN 560 - Studies in Spanish American Poetry Credits: 3
- SPAN 565 - Studies in Spanish American Drama Credits: 3
- SPAN 576 - Advanced Translation Credits: 3
- SPAN 580 - Contemporary Hispanic Institutions Credits: 3
- SPAN 635 - Seminar in Don Quixote Credits: 3
- SPAN 650 - Seminar in Twentieth-Century Drama Credits: 3
- SPAN 655 - Seminar in Twentieth-Century Prose Credits: 3
- SPAN 670 - Seminar in Spanish American Prose Credits: 3
- SPAN 675 - Seminar in Literature and Art Credits: 3
- SPAN 680 - Seminar in Literature and Society Credits: 3
- SPAN 685 - Seminar in Literature and Ideas Credits: 3

Note:

Courses may be substituted with advisor-approved language and literature-related electives.

Total: 18 credits

▲ Concentration in ASTL: Geography (AGEO)

The 21-credit geography concentration includes five required geography courses and two approved elective courses. The concentration is designed for elementary, middle and high school teachers who seek a professional specialization in geography. Coursework provides an add-on endorsement in geography for Virginia teachers.

Course Work

- GGS 520 - Geography for Teachers Credits: 3
- GGS 533 - Issues in Regional Geography Credits: 1-6 (Must register for 3 credits)
- GGS 550 - Geospatial Science Fundamentals Credits: 3
- GGS 603 - Geographic Perspectives on Complex Natural Resource Management Credits: 3
- GGS 690 - Advanced Practicum in Geographical Applications Credits: 1-6 (Must register for 3 credits)

Electives

Choose two courses from the following:

- GGS 505 - Transportation Geography Credits: 3
- GGS 553 - Geographic Information System Credits: 3
- GGS 563 - Advanced Geographic Information Systems Credits: 3
- GGS 581 - World Food and Population Credits: 3
- GGS 590 - Selected Topics in Geography Credits: 1-3

Total: 21 credits

▲ Concentration in ASTL: History (AHIS)
The 18-credit history concentration includes one geography and five history courses that are required. The concentration is designed for elementary, middle, and high school teachers who seek a foundation in the history courses that are taught within Virginia public schools.

### Course Work

- **GGS 520 - Geography for Teachers** Credits: 3
- **HIST 510 - Approaches to Modern World History** Credits: 3
- **HIST 601 - Themes in U.S. History I** Credits: 3
- **HIST 602 - Themes in U.S. History II** Credits: 3
- **HIST 605 - Themes in European History I** Credits: 3
- **HIST 695 - History Symposium** Credits: 1-3 (must register for 3 credits)

**Note:**

Courses may be substituted with advisor-approved history electives.

**Total: 18 credits**

▲ **Concentration in ASTL: Individualized (AATL)**

The 18-credit individualized concentration is developed in concert with a student’s advisor to provide course work in a student’s specialized area that is not provided in other ASTL concentrations. The student works with the program director to design a program of study that provides individualized learning experiences in an area of expertise relevant to one’s professional educational setting.

▲ **Concentration in ASTL: Literacy PK–12 Classroom Teachers (AP12)**

This 18-credit concentration includes three required literacy courses and three approved electives in ESOL, special education, psychology, secondary and elementary education, early childhood, writing, and other areas. The course work includes theory and strategies in literacy and reading for teachers in any discipline, PK–12.

### Course Work

- **EDRD 630 - Advanced Literacy Foundations and Instruction, Birth to Middle Childhood** Credits: 3
- **EDRD 631 - Advanced Literacy Foundations and Instruction, Adolescence through Adulthood** Credits: 3
- **EDRD 632 - Literacy Assessments and Interventions for Groups** Credits: 3

### Electives

Choose 9 credits from the following:

- **EDCI 520 - Assessment of Language Learners** Credits: 3
- **EDRD 615 - Reading/Writing for Multilingual Students** Credits: 3
- EDRD 633 - Literacy Assessments and Interventions for Individuals Credits: 3
- EDRD 637 - Supervised Literacy Practicum Credits: 2-3 (Must register for 3 credits)
- EDSE 662 - Consultation and Collaboration Credits: 3
- EDSE 627 - Assessment Credits: 3

Note:

Student may choose an alternate elective with advisor approval.

Total: 18 credits

▲ Concentration in ASTL: Literacy: Reading Specialist (ALRS)

This 21-credit concentration is a state-approved sequence of courses leading to Virginia reading specialist licensure. Course work includes foundational knowledge, instructional and assessment strategies for individuals and groups, and preparation as a literacy coach and staff developer. Licensure also requires a master’s degree, passing of the Virginia Reading Assessment, and three years of teaching under contract.

Course Work

- EDRD 630 - Advanced Literacy Foundations and Instruction, Birth to Middle Childhood Credits: 3
- EDRD 631 - Advanced Literacy Foundations and Instruction, Adolescence through Adulthood Credits: 3
- EDRD 632 - Literacy Assessments and Interventions for Groups Credits: 3
- EDRD 633 - Literacy Assessments and Interventions for Individuals Credits: 3
- EDRD 634 - School-Based Leadership in Literacy Credits: 3
- EDRD 635 - School-Based Inquiry in Literacy Credits: 3
- EDRD 637 - Supervised Literacy Practicum Credits: 2-3 (Must register for 3 credits)

Total: 21 credits

▲ Concentration in ASTL: Mathematics (Middle and Secondary) (AMTH)

This 18-credit concentration provides advanced professional development in mathematics teaching and learning for practicing middle or high school mathematics teachers. Students pursue either Middle Education, Grades 6-8 or Secondary Education, Grades 9-12 course work dependent on their current teaching assignment

Course Work

Middle Education, Grades 6-8
• EDCI 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
• MATH 601 - Analysis I for Teachers Credits: 3
• MATH 604 - Geometry for Teachers Credits: 3
• MATH 605 - Discrete/Finite Mathematics for Teachers Credits: 3
• MATH 607 - Algebraic Structure for Teachers Credits: 3
• MATH 608 - Problem Solving in Mathematics Credits: 3

Total: 18 credits

Secondary Education, Grades 9-12

• EDCI 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
• MATH 601 - Analysis I for Teachers Credits: 3
• MATH 602 - Analysis II for Teachers Credits: 3
• MATH 604 - Geometry for Teachers Credits: 3
• MATH 605 - Discrete/Finite Mathematics for Teachers Credits: 3
• MATH 607 - Algebraic Structure for Teachers Credits: 3

Total: 18 credits

▲ Concentration in ASTL: Physical Education (APED)

The 18-credit physical education concentration provides course work in research design, curriculum development, collaborative supervision, research in pedagogy, and advanced adapted content. It is designed for practicing PE teachers seeking to improve their professional knowledge and teaching performance for improving student learning.

Course Work

• EDRS 590 - Education Research Credits: 3 or EFHP 623 - Research Design and Statistical Reasoning Credits: 3
• PHED 670 - Analysis of Teaching in Physical Education Credits: 3
• PHED 672 - Curriculum and Assessment in Physical Education Credits: 3
• PHED 673 - Motor Development for Special Populations Credits: 3
• PHED 680 - Mentoring and Supervising in Physical Education Credits: 3

Electives

Choose one course from the following:

• DANC 580 - Laban Movement Analysis Credits: 3
• EDCI or EDIT 705 - Instructional Design Credits: 3
• EDLE 610 - Leading Schools and Communities Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3
- EFHP 610 - Advanced Exercise Physiology Credits: 3
- EFHP 611 - Fitness Assessment: Theory and Practice Credits: 3
- EFHP 614 - Advanced Exercise Nutrition Credits: 3
- EFHP 618 - Exercise and Sport Psychology Credits: 3
- HEAL 516 - Program Development and Resources in Health Education Credits: 3

Note:

Student may choose an alternate elective with advisor approval.

Total: 18 credits

▲ Concentration in ASTL: Science (ASCI)

The 18-credit science concentration provides advanced professional development in science teaching and learning for practicing elementary, middle, or high school science teachers.

Course Work

- EDCI 663 - Research in Science Teaching Credits: 3
- EDCI 683 - Curriculum Development and Evaluation in Science Education Credits: 3
- EDCI 693 - Leadership and Organizational Issues in Science Education Credits: 3
- EDLE 791 - Internship in Educational Leadership Credits: 3

Electives

Choose 6 credits of science course work with advisor approval.

Total: 18 credits

▲ Concentration in ASTL: Special Education (ASPE)

The 18-credit special education concentration provides advanced expertise for educators, administrators, and other professionals providing services to individuals with special needs. Students select one of the following areas of emphasis: applied behavior analysis; assistive technology; students with disabilities who access the adapted curriculum; students with disabilities who access the general curriculum; teaching students with autism; visual impairments.

Course Work
Applied Behavior Analysis Emphasis

- EDSE 619 - Applied Behavior Analysis: Principles, Procedures, and Philosophy Credits: 3
- EDSE 621 - Applied Behavior Analysis: Empirical Bases Credits: 3
- EDSE 623 - Applied Behavior Analysis: Assessments and Interventions Credits: 3
- EDSE 624 - Applied Behavior Analysis: Applications Credits: 3
- EDSE 625 - Applied Behavior Analysis: Verbal Behavior Credits: 3
- EDSE 790 - Internship in Special Education Credits: 1-6 (Must register for 3 credits)

Total: 18 credits

Assistive Technology Emphasis

Choose 18 credits from the following:

- EDSE or EDIT 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
- EDSE or EDIT 523 - Accessibility/Input Modification Credits: 1-3
- EDSE or EDIT 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
- EDSE or EDIT 525 - Software for Individuals with Special Needs Credits: 1-2
- EDSE or EDIT 526 - Web Accessibility and Design Credits: 3
- EDSE 527 - Adapted Sports, Recreation, and Leisure Credits: 1
- EDSE 528 - Low-Tech Assistive Technology Solutions Credits: 1
- EDSE 622 - Augmentative Communication Credits: 2
- EDSE 797 - Advanced Topics in Education Credits: 1-6
- EDUC 600 - Workshop in Education Credits: 1-6

Note:

Assistive technology courses are offered for variable credit each semester. Select 18 credits to meet the concentration requirement.

Total: 18 credits

Students with Disabilities who Access the Adapted Curriculum Emphasis

Choose 18 credits from the following:

- EDSE 501 - Introduction to Special Education Credits: 3
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3
- EDSE 531 - Transition and Community-Based Instruction Credits: 3
• EDSE 532 - Positive Behavior Supports Credits: 3
• EDSE 533 - Curriculum and Assessment in Severe Disabilities Credits: 3
• EDSE 534 - Communication and Severe Disabilities Credits: 3
• EDSE 547 - Medical and Developmental Risk Factors for Children with Disabilities Credits: 3
• EDSE 557 - Foundations of Language and Literacy for Diverse Learners Credits: 3
• EDSE 661 - Curriculum and Methods: Severe Disabilities Credits: 3
• EDSE 662 - Consultation and Collaboration Credits: 3
• EDSE 669 - Interdisciplinary Approach for Children with Sensory and Motor Disabilities Credits: 3
• EDSE 790 - Internship in Special Education Credits: 1-6 (Must complete a minimum of four credits of internship)
• EDSE 791 - Midpoint Portfolio Credits: 1
• EDSE 792 - Final Portfolio Credits: 1

Total: 18 credits

Students with Disabilities who Access the General Curriculum Emphasis

Choose 18 credits from the following:

• EDSE 501 - Introduction to Special Education Credits: 3
• EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3
• EDSE 503 - Language Development and Reading Credits: 3
• EDSE 540 - Characteristics of Students with Disabilities who Access the General Curriculum Credits: 3
• EDSE 544 - Adapted Instructional Methods and Transition for Secondary Learners Credits: 3
• EDSE 627 - Assessment Credits: 3
• EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum Credits: 3
• EDSE 629 - Secondary Curriculum and Strategies for Students with Disabilities who Access the General Curriculum Credits: 3
• EDSE 662 - Consultation and Collaboration Credits: 3
• EDSE 790 - Internship in Special Education Credits: 1-6 (Must complete two 2-credit internships: one elementary placement and one secondary placement)
• EDSE 791 - Midpoint Portfolio Credits: 1
• EDSE 792 - Final Portfolio Credits: 1

Total: 18 credits

Teaching Students with Autism Emphasis

• EDSE 534 - Communication and Severe Disabilities Credits: 3
• EDSE 620 - Managing Severely Challenging Behaviors and Applied Behavior Analysis Credits: 3
• EDSE 634 - Characteristics of Students with Autism Credits: 3
• EDSE 635 - Interventions for Students with Autism Credits: 3
• EDSE 665 - Families of Children with Special Needs Credits: 3

Note:

Students must choose an elective course from among the other ASTL Special Education emphases to complete the required 18 credits.

Total: 18 credits

Visual Impairments Emphasis

Choose 18 credits from the following:

• EDSE 511 - Characteristics of Students with Visual Impairments Credits: 1
• EDSE 512 - Braille Code Credits: 3
• EDSE 513 - Medical and Educational Implications of Visual Impairments Credits: 3
• EDSE 514 - Orientation and Mobility for Students with Visual Impairments Credits: 2
• EDSE 518 - Curriculum and Assessment of Students with Visual Impairments Credits: 3
• EDSE 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
• EDSE 532 - Positive Behavior Supports Credits: 3
• EDSE 561 - Teaching Methods for Students with Visual Impairments Credits: 3
• EDSE 616 - Braille Reading and Writing Credits: 3
• EDSE 662 - Consultation and Collaboration Credits: 3
• EDSE 790 - Internship in Special Education Credits: 1-6 (Must complete four credits of internship)
• EDSE 791 - Midpoint Portfolio Credits: 1
• EDSE 792 - Final Portfolio Credits: 1

Total: 18 credits

▲ Concentration in ASTL: Teacher Leadership (ATL)

This 18-credit concentration provides advanced professional development in school leadership. The educational leadership course work focuses on teachers as leaders in their classrooms, teams, departments, programs, and schools.

Course Work

• EDLE 610 - Leading Schools and Communities Credits: 3
• EDLE 612 - Education Law Credits: 3
• EDLE 618 - Supervision and Evaluation of Instruction Credits: 3
• EDLE 620 - Organizational Theory and Leadership Credits: 3
• EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
• EDUC 598 - Directed Reading, Research, and Individual Projects Credits: 1-6 (Must register for 3 credits)

Total: 18 credits

▲ Concentration in Early Childhood Education for Diverse Learners (ECDL)

This 30-credit program leads to a master's degree for professionals who already hold an early childhood education teacher license or are interested in working in an early childhood education context outside the classroom. Students who wish to seek Early Childhood Education, PK-3 licensure are advised to consider completing the Early Childhood Education, PK-3 Licensure certificate program in conjunction with the MEd. Students may use their certificate coursework to fulfill the elective credits for the MEd program.

Course Work

• ECED 601 - Frameworks for Early Childhood Education Credits: 3

Choose 3 credits from the following:
• ECED 585 - Research in Early Childhood Education Credits: 3
• ECED 591 - Policy Perspectives in Early Childhood Education Credits: 3

Choose 3 credits from the following:
• ECED 503 - Inclusive Curriculum for Young Learners: Planning Instruction and Guidance Credits: 3
• ECED 513 - Curriculum Across the Content Areas for Diverse Young Learners Credits: 3
• ECED 514 - Mathematics and Science for Diverse Young Learners Credits: 3

Choose 3 credits from the following:
• ECED 502 - Foundations of Language and Literacy for Diverse Young Learners Credits: 3
• ECED 512 - Language and Literacy Assessment and Instruction for Diverse Young Learners Credits: 3
• ECED 522 - Developing Language, Literacy, and Communication of Diverse Young Learners Credits: 3

Choose 3 credits from the following:
• ECED 504 - Families, Communities, and Schools Credits: 3
• ECED 524 - Families of Children with Special Needs Credits: 3

Choose 3 credits from the following:
• ECED 511 - Assessment of Diverse Young Learners Credits: 3
• ECED 521 - Family-Centered Assessment of Diverse Young Learners Credits: 3

Electives (12 credits)

Choose 12 credits from graduate ECED-prefix courses

Portfolio Requirement

A professional portfolio is required. The portfolio reflects the student's professional development throughout the program and contains examples of performance assessments associated with standards.

Total: 30 credits
▲ Concentration in TFA - Early Childhood Education (Teach for America) (TECE)

This 30-credit concentration is designed to prepare Teach for America Corp members to teach culturally, linguistically, and ability diverse Early Childhood students. Note: this is only available to Teach for America Corp members in Washington DC.

Course Work

- ECED 501 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3
- ECED 503 - Inclusive Curriculum for Young Learners: Planning Instruction and Guidance Credits: 3
- ECED 504 - Families, Communities, and Schools Credits: 3
- ECED 511 - Assessment of Diverse Young Learners Credits: 3
- ECED 512 - Language and Literacy Assessment and Instruction for Diverse Young Learners Credits: 3
- ECED 513 - Curriculum Across the Content Areas for Diverse Young Learners Credits: 3
- ECED 514 - Mathematics and Science for Diverse Young Learners Credits: 3
- ECED 585 - Research in Early Childhood Education Credits: 3
  or
- ECED 591 - Policy Perspectives in Early Childhood Education Credits: 3
- ECED 601 - Frameworks for Early Childhood Education Credits: 3
- ECED 790 - Internship in Early Childhood Education Credits: 1-6 (One 3-credit internship experience is required)

Portfolio Requirement

A professional portfolio is required. The portfolio reflects the student's professional development throughout the program and contains examples of performance assessments associated with standards.

Total: 30 credits

▲ Concentration in Elementary Education (ELED)

The 39-credit Elementary Education concentration and initial licensure component provides professionals with the specialized knowledge, skills, and dispositions needed to meet the educational needs of students attending today's elementary schools. Specific content and endorsement courses are required; all courses are taught in cohorts only. Three cohort models (one- or two- semester internships, and an intensive model) provide flexibility for all students. The two-semester internship cohort begins each fall semester; the one-semester internship cohort begins each summer semester, and the intensive cohort begins each spring semester.

All students are required to submit and successfully complete a series of performance-based assessments. These assessments include content knowledge, pedagogical skills, and dispositions.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all course work.
Course Work

- EDCI 544 - Curriculum and Methods of Teaching in Elementary Education Credits: 3
- EDCI 545 - Assessment and Differentiation Credits: 3
- EDCI 546 - Integrating Technology in Elementary Classrooms: Literacy Credits: 1
- EDCI 547 - Integrating Technology in Elementary Classrooms: Mathematics Credits: 1
- EDCI 548 - Integrating Technology in Elementary Classrooms: Social Studies and Fine Arts Credits: 1
- EDCI 552 - Mathematics Methods for the Elementary Classroom Credits: 1-3 (Must register for 3 credits)
- EDCI 553 - Science Methods for the Elementary Classroom Credits: 1-3 (Must register for 3 credits)
- EDCI 554 - Methods of Teaching Social Studies and Integrating Fine Arts in the Elementary Classroom Credits: 3
- EDCI 555 - Literacy Teaching and Learning in Diverse Elementary Classrooms I Credits: 3
- EDCI 556 - Literacy Teaching and Learning in Diverse Elementary Classrooms II Credits: 1-3 (Must register for 3 credits)
- EDCI 559 - Research and Assessment in Elementary Education Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (total 6 credits over four semesters)
  Students register for variable credit as follows: First year: Fall, 2 credits/ Spring, 1 credit; Second year: Fall, 1 credit/ Spring, 2 credits.
- EDUC 542 - Foundations of Education Credits: 3
- EDUC 543 - Children, Family, Culture, and Schools, 4-12 Year Olds Credits: 3

Total: 39 credits

▲ Concentration in TFA - Elementary Education (Teach for America) (TEED)

This 33-credit concentration is designed to prepare Teach for America Corp members to teach culturally, linguistically, and ability diverse elementary students. Note: this is only available to Teach for America Corp members in Washington DC.

Course Work

- EDCI 544 - Curriculum and Methods of Teaching in Elementary Education Credits: 3
- EDCI 545 - Assessment and Differentiation Credits: 3
- EDCI 552 - Mathematics Methods for the Elementary Classroom Credits: 1-3 (must register for 3 credits)
- EDCI 553 - Science Methods for the Elementary Classroom Credits: 1-3 (must register for 3 credits)
- EDCI 554 - Methods of Teaching Social Studies and Integrating Fine Arts in the Elementary Classroom Credits: 3
- EDCI 555 - Literacy Teaching and Learning in Diverse Elementary Classrooms I Credits: 3
- EDCI 559 - Research and Assessment in Elementary Education Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Year-long internship: students must register for 3 credits in the fall and 3 credits in the spring. Semester internship and intensive cohort: students must register for 6 credits during their internship)
- EDUC 542 - Foundations of Education Credits: 3
- EDUC 543 - Children, Family, Culture, and Schools, 4-12 Year Olds Credits: 3
Total: 33 credits

▲Concentration in English as a Second Language (PK-12)(CISL)

This 39-credit ESL/ESOL PK-12 concentration provides initial state teacher licensure (endorsement) for candidates wanting to teach in Virginia public schools, grades PK to 12. This program provides teachers with the specialized knowledge, skills, and professional dispositions required to pass an oral and written proficiency assessment in English to meet state licensing requirements and national professional standards. This program has a licensure component of 30 credits and requires an additional 9 credits for completion of the MEd in Curriculum and Instruction.

Prerequisites for admission: Six credits of a modern foreign language (graduate or undergraduate, do not count toward the MEd).

Field experience: Field experiences involving observations and analyses in public schools are required throughout the program; a maximum of 15 clock hours per course or 30 clock hours per term. Arrangements can be made with each course instructor.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (30 credits)

- EDCI 510 - Linguistics for PreK-12 ESOL Teachers Credits: 3
- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 519 - Methods of Teaching Multilingual Students Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 525 - Emergent Literacy for English Language Learners, PK-12 Credits: 3
- EDRD 610 - Content Literacy for English Language Learners, PK-12 Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3

Note:

For licensed teachers only, the add-on endorsement in ESL PK-12 requires completion of all licensure course work with the exception of EDCI 790.

MEd Prerequisites

All licensure course work listed above

MEd Requirements (9 credits)
● EDCI 521 - Curriculum Development for Language Learners Credits: 3
● EDCI 777 - Research to Practice Credits: 3
● EDRS 590 - Education Research Credits: 3
or
● 3-credit elective course (approved by advisor)

Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:

● Placement internship: One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.
● On-the-job internship: Available only to students who are employed as full-time, provisionally licensed teachers and are teaching ESL/ESOL in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensed teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.

▲Concentration in Foreign Language: Arabic (EARB)

This 39-credit Foreign Language: Arabic concentration is designed to provide an interdisciplinary, theory-based course of study for initial licensure and provisionally licensed teachers. It is intended to assist in the development of a reflective stance toward practice and to enhance ability to address critical issues in language and learning. It also intends to advance their fundamental understanding about language, technology, pedagogy, and culture, as well as issues related to diversity in schools and in society at large. This program has a licensure component of 27 credits and requires an additional 12 credits for completion of the MEd.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (27 credits)

● EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
● EDCI 520 - Assessment of Language Learners Credits: 3
● EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
● EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
● EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits in the Arabic-specific section)
● EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
● EDUC 537 - Foundations of Multicultural Education Credits: 3
● EDUC 539 - Human Development and Learning PK-12 Credits: 3
MEd Prerequisites

All licensure course work listed above

MEd Requirements (12 credits)

- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDRS 590 - Education Research Credits: 3
- EDSE 501 - Introduction to Special Education Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3

Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:

- **Placement Internship:** One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.
- **On-the-job Internship:** Available only to students who are employed as full-time, provisionally licensed teachers and are teaching in their endorsement area in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensured teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.

▲Concentration in Foreign Language: Chinese (ECHN)

This 39-credit Foreign Language: Chinese concentration is designed to provide an interdisciplinary, theory-based course of study for initial licensure and provisionally licensed teachers. It is intended to assist in the development of a reflective stance toward practice and to enhance ability to address critical issues in language and learning. It also intends to advance their fundamental understanding about language, technology, pedagogy, and culture, as well as issues related to diversity in schools and in society at large. This program has a licensure component of 27 credits and requires an additional 12 credits for completion of the MEd.

**Grading Policy:** Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (27 credits)
- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
- EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits in the Chinese-specific section)
- EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3

MEd Prerequisites

All licensure course work listed above

MEd Requirements (12 credits)

- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDRS 590 - Education Research Credits: 3
- EDSE 501 - Introduction to Special Education Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3

Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:

- **Placement Internship:** One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.
- **On-the-job Internship:** Available only to students who are employed as full-time, provisionally licensed teachers and are teaching in their endorsement area in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensed teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.

▲ Concentration in Foreign Language: French (EFRN)

This 39-credit Foreign Language: French concentration is designed to provide an interdisciplinary, theory-based course of study for initial licensure and provisionally licensed teachers. It is intended to assist in the development of a reflective stance toward practice and to enhance ability to address critical issues in language and learning. It also intends to advance their fundamental understanding about language, technology, pedagogy, and culture, as well as issues related to diversity in schools and in society at large. This program has a licensure component of 27 credits and requires an additional 12 credits for completion of the MEd.
Grading Policy: Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (27 credits)

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
- EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits in the French-specific section)
- EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3

MEd Prerequisites

All licensure course work listed above

MEd Requirements (12 credits)

- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDRS 590 - Education Research Credits: 3
- EDSE 501 - Introduction to Special Education Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3

Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:

- **Placement Internship:** One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.
- **On-the-job Internship:** Available only to students who are employed as full-time, provisionally licensed teachers and are teaching in their endorsement area in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensed teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.
▲Concentration in Foreign Language: German (EGRM)

This 39-credit Foreign Language: German concentration is designed to provide an interdisciplinary, theory-based course of study for initial licensure and provisionally licensed teachers. It is intended to assist in the development of a reflective stance toward practice and to enhance ability to address critical issues in language and learning. It also intends to advance their fundamental understanding about language, technology, pedagogy, and culture, as well as issues related to diversity in schools and in society at large. This program has a licensure component of 27 credits and requires an additional 12 credits for completion of the MEd.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (27 credits)

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
- EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits in the German-specific section)
- EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3

MEd Prerequisites

All licensure course work listed above

MEd Requirements (12 credits)

- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDRS 590 - Education Research Credits: 3
- EDSE 501 - Introduction to Special Education Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3

Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:
• **Placement Internship:** One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.

• **On-the-job Internship:** Available only to students who are employed as full-time, provisionally licensed teachers and are teaching in their endorsement area in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensed teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.

▲**Concentration in Foreign Language: Japanese (EJPN)**

This 39-credit Foreign Language: Japanese concentration is designed to provide an interdisciplinary, theory-based course of study for initial licensure and provisionally licensed teachers. It is intended to assist in the development of a reflective stance toward practice and to enhance ability to address critical issues in language and learning. It also intends to advance their fundamental understanding about language, technology, pedagogy, and culture, as well as issues related to diversity in schools and in society at large. This program has a licensure component of 27 credits and requires an additional 12 credits for completion of the MEd.

**Grading Policy:** Students enrolled in this degree program must earn a B or higher in all licensure course work.

**Course Work**

**Licensure Requirements (27 credits)**

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
- EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits in the Japanese-specific section)
- EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3

**MEd Prerequisites**

All licensure course work listed above

**MEd Requirements (12 credits)**

- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDRS 590 - Education Research Credits: 3
- EDSE 501 - Introduction to Special Education Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3
Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:

- **Placement Internship:** One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.
- **On-the-job Internship:** Available only to students who are employed as full-time, provisionally licensed teachers and are teaching in their endorsement area in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensed teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.

▲Concentration in Foreign Language: Latin (ELTN)

This 39-credit Foreign Language: Latin concentration is designed to provide an interdisciplinary, theory-based course of study for initial licensure and provisionally licensed teachers. It is intended to assist in the development of a reflective stance toward practice and to enhance ability to address critical issues in language and learning. It also intends to advance their fundamental understanding about language, technology, pedagogy, and culture, as well as issues related to diversity in schools and in society at large. This program has a licensure component of 27 credits and requires an additional 12 credits for completion of the MEd.

**Grading Policy:** Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (27 credits)

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
- EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits in the Latin-specific section)
- EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3

MEd Prerequisites

All licensure course work listed above
MEd Requirements (12 credits)

- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDRS 590 - Education Research Credits: 3
- EDSE 501 - Introduction to Special Education Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3

Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:

- Placement Internship: One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.
- On-the-job Internship: Available only to students who are employed as full-time, provisionally licensed teachers and are teaching in their endorsement area in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensed teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.

▲Concentration in Foreign Language: Russian (ERUS)

This 39-credit Foreign Language: Russian concentration is designed to provide an interdisciplinary, theory-based course of study for initial licensure and provisionally licensed teachers. It is intended to assist in the development of a reflective stance toward practice and to enhance ability to address critical issues in language and learning. It also intends to advance their fundamental understanding about language, technology, pedagogy, and culture, as well as issues related to diversity in schools and in society at large. This program has a licensure component of 27 credits and requires an additional 12 credits for completion of the MEd.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (27 credits)

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
- EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits in the Russian-specific section)
• EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
• EDUC 537 - Foundations of Multicultural Education Credits: 3
• EDUC 539 - Human Development and Learning PK-12 Credits: 3

MEd Prerequisites

All licensure course work listed above

MEd Requirements (12 credits)

• EDCI 521 - Curriculum Development for Language Learners Credits: 3
• EDCI 777 - Research to Practice Credits: 3
• EDRS 590 - Education Research Credits: 3
• EDSE 501 - Introduction to Special Education Credits: 3
  or
• EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3

Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:

• Placement Internship: One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.
• On-the-job Internship: Available only to students who are employed as full-time, provisionally licensed teachers and are teaching in their endorsement area in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensed teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.

▲Concentration in Foreign Language: Spanish (ESPN)

This 39-credit Foreign Language: Spanish concentration is designed to provide an interdisciplinary, theory-based course of study for initial licensure and provisionally licensed teachers. It is intended to assist in the development of a reflective stance toward practice and to enhance ability to address critical issues in language and learning. It also intends to advance their fundamental understanding about language, technology, pedagogy, and culture, as well as issues related to diversity in schools and in society at large. This program has a licensure component of 27 credits and requires an additional 12 credits for completion of the MEd.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work
Licensure Requirements (27 credits)

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
- EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits in the Spanish-specific section)
- EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3

MEd Prerequisites

All licensure course work listed above

MEd Requirements (12 credits)

- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDRS 590 - Education Research Credits: 3
- EDSE 501 - Introduction to Special Education Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3

Total: 39 credits

Internship Options

A six-credit, 15-week daytime internship, EDCI 790, is required for completion of the state-approved licensure program. Both elementary and middle school or secondary school placements are required. Two options are available to meet the needs of most individuals:

- **Placement Internship:** One semester, daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.
- **On-the-job Internship:** Available only to students who are employed as full-time, provisionally licensed teachers and are teaching in their endorsement area in an accredited school. In addition to a fall or spring experience, this option includes a summer or other appropriate experience.

In lieu of an internship, provisionally licensed teachers may use their full-time teaching to satisfy the internship requirements; however, the 39-credit master's degree requires that candidates substitute six credits in approved course work for the internship.

▲ Concentration in Gifted Child Education (AGCE)
The 21-credit gifted child education concentration provides advanced professional development through endorsement or master’s degree for teachers of gifted students. The concentration meets NAGC/CEC graduate standards and focuses on culturally diverse, multilingual, twice exceptional, and traditionally defined gifted students and programs.

**Course Work**

- EDCI 621 - Introduction to Gifted and Talented Learners Credits: 3
- EDCI 622 - Curriculum Differentiation for Diverse Learners Credits: 3
- EDCI 623 - Models and Strategies for Teaching Gifted Learners Credits: 3
- EDCI 624 - Assessment, Identification, and Evaluation of Gifted Learners Credits: 3
- EDCI 625 - Contemporary Issues and Trends in Gifted Education Credits: 3
- EDCI 626 - Action Research in Gifted Education Credits: 3
- EDCI 627 - Advanced Practicum in Gifted Education Credits: 3

Note: One year of successful full-time teaching in an accredited public or non-public school may be accepted in lieu of the EDCI 627 practicum (VA Licensure Regulations for School Personnel, 1998). A 3-credit elective course must be chosen with advisor approval to meet the 21-credit requirement.

**Total: 21 credits**

**Instructional Technology**

Four concentrations with an instructional technology focus provide professionals the specialized knowledge and skills needed to apply a wide range of learning technologies to achieve educational and instructional goals in schools, communities, and corporate or public settings. The concentrations combine current theoretical models with practical, hands-on experiences to cultivate the design of innovative, engaging and inclusive learning opportunities and instructional applications using state-of-the-art technologies. These concentrations serve the various needs and interests of specific types of learning organizations and instructional technology clients including instructional design and development, integration of technology in schools, and assistive and special education technology.

▲**Concentration in IT - Assistive and Special Education Technology (IASP)**

**Course Work**

- EDSE 510 or EDIT 510 - Introduction to Assistive Technology Credits: 3
- EDSE 526 or EDIT 526 - Web Accessibility and Design Credits: 3
- EDSE 590 or EDIT 590 - Educational Research in Technology Credits: 3
- EDSE 610 - Designing Adaptive Environments Credits: 2
- EDSE 649 - Advanced Clinical Psycho-Educational Assessment in Special Education Credits: 3
- EDSE 782 - Comprehensive Topics in Special Education: Trends and Issues Credits: 3

**Electives**
Assistive and Special Education Technology elective courses are offered for variable credit each semester. Students take a total of 13 credits of electives.

Choose at least 8 credits of direct AT tools courses from the following:

- EDSE 522 or EDIT 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
- EDSE 523 or EDIT 523 - Accessibility/Input Modification Credits: 1-3
- EDSE 524 or EDIT 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
- EDSE 525 or EDIT 525 - Software for Individuals with Special Needs Credits: 1-2
- EDSE 527 - Adapted Sports, Recreation, and Leisure Credits: 1
- EDSE 528 - Low-Tech Assistive Technology Solutions Credits: 1
- EDSE 529 or EDIT 529 - Internet as an Assistive Technology Tool Credits: 2
- EDSE 622 - Augmentative Communication Credits: 2

Choose as many as 5 credits from the following non-AT tools courses:

- Any EDIT course
- EDSE 534 - Communication and Severe Disabilities Credits: 3
- EDSE 662 - Consultation and Collaboration Credits: 3
- EDSE 669 - Interdisciplinary Approach for Children with Sensory and Motor Disabilities Credits: 3
- EDIT 772 - Web-Based Instructional Tools Credits: 1-3

Total: 30 credits

▲Concentration in IT - Instructional Design and Development (IIDD)

Course Work

- EDIT 526 - Web Accessibility and Design Credits: 3
- EDIT 590 - Educational Research in Technology Credits: 3 or EDRS 590 - Education Research Credits: 3
- EDIT 704 - Instructional Technology Foundations and Theories of Learning Credits: 3
- EDIT 705 - Instructional Design Credits: 3
- EDIT 730 - Advanced Instructional Design Credits: 3
- EDIT 732 - Analysis and Design of Technology-Based Learning Environments Credits: 3
- EDIT 752 - Design and Implementation of Technology-based Learning Environments Credits: 3
- EDIT 601 - Instructional Design and Development (IDD) Portfolio Credits: 1
- EDIT 701 - Advanced Instructional Design and Development (IDD) Portfolio Credits: 1

Electives

Choose seven credits from any EDIT courses.

Total: 30 credits
Concentration in IT - Instructional Design and Development Immersion (IMDD)

Course Work

Prerequisites (6 credits)

- EDIT 526 - Web Accessibility and Design Credits: 3
- EDIT 705 - Instructional Design Credits: 3

Required Courses (24 credits)

- EDIT 590 - Educational Research in Technology Credits: 3 or EDRS 590 - Education Research Credits: 3
- EDIT 730 - Advanced Instructional Design Credits: 3
- EDIT 732 - Analysis and Design of Technology-Based Learning Environments Credits: 3
- EDIT 752 - Design and Implementation of Technology-based Learning Environments Credits: 3
- EDIT 791 - Project Development Practicum Credits: 6
- EDIT 792 - Project Development Practicum Credits: 6

Total: 30 credits

Concentration in IT - Integration of Technology in Schools (IITS)

Course Work

- EDCI 710 - Technology and the Culture of Schools Credits: 3
- EDCI 712 - Technology and Learning Credits: 3
- EDCI 714 - Methods of Integration Credits: 3
- EDCI 716 - Principles of Technology Leadership Credits: 3
- EDIT 711 - Teaching with Technology I: Telecommunications and Databases Credits: 3
- EDIT 713 - Teaching with Technology II: Graphics, TV and Video, and Simulations Credits: 3
- EDIT 715 - Teaching with Technology III: Publishing and Computational Tools Credits: 3
- EDIT 717 - Teaching with Technology IV: Hypermedia and Emerging Technologies Credits: 3
- EDIT 719 - Tools 5: Web 2.0 and Digital Video Editing Credits: 3
- EDIT 721 - Web-Based Learning Credits: 3
- EDIT 790 - Practicum in Instructional Technology Credits: 1-6 (Must register for 6 credits)
Concentration in International Education FAST TRAIN ESOL (PK-12) (FTSL)

This 30-credit concentration is specifically designed for teachers and educators who are working abroad or plan on teaching overseas, or individuals living outside the Washington, DC area who want a license and master's degree in ESOL. This program has a licensure component of 24 credits and requires an additional 6 credits for completion of the MEd. All course work requires 20 hours of integrated fieldwork observation and practice. The convenient schedule enables participants to complete the program through on-campus study during two summers and on-line study during the academic year.

Grading Policy: Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (24 credits)*

- EDCI 510 - Linguistics for PreK-12 ESOL Teachers Credits: 3
- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 519 - Methods of Teaching Multilingual Students Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDRD 525 - Emergent Literacy for English Language Learners, PK-12 Credits: 3
- EDRD 610 - Content Literacy for English Language Learners, PK-12 Credits: 3
- EDUC 511 - Introduction to Education in International Schools Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3

*Note: Students pursuing ESOL PK-12 Virginia Licensure must complete an approved internship experience satisfied by either taking one year of full time teaching that is approved by the program or the following course:

- EDCI 790 - Internship in Education Credits: 1-6 credits (for 6 credits)

MEd Requirements (6 credits)

- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3

Note:

All course work, endorsements, state requirements, and tests must be finished prior to the internship. Some course work requires field experience.
Total: 30 credits

▲Concentration in International Education FAST TRAIN (Elementary) PK-6 (FTEL)

This 30-credit hour concentration prepares educators for international teaching assignments. This program has an 18 credit licensure component and requires an additional 12 credits for completion of the MEd. The course work may be completed in the part-time evening program or during the summer five week intensive program. All course work requires 20 hours of integrated fieldwork observation and practice.

In addition, this program prepares students who wish to teach in International Baccalaureate (IB) schools worldwide by integrating IB curriculum into the licensure coursework. Students completing the licensure requirements may take one additional course to become eligible for the IB Teacher Award Level I through the IB:

- EDUC 621 - Teaching and Learning in the International Baccalaureate Primary Years Program

Grading Policy: Students enrolled in this degree program must earn a B or higher in all licensure course work.

Course Work

Licensure Requirements (18 credits)*

- EDUC 511 - Introduction to Education in International Schools Credits: 3
- EDUC 512 - Teaching Elementary Social Studies in International Schools Credits: 3
- EDUC 513 - Teaching Elementary Math in International Schools Credits: 3
- EDUC 514 - Teaching Elementary Science in International Schools Credits: 3
- EDUC 516 - Language Across the Elementary International School Curriculum Credits: 3
- EDUC 520 - Elementary Curriculum, Instruction, and Assessment in International Schools Credits: 3
*Note: Students pursuing ESOL PK-12 Virginia Licensure must complete an approved internship experience satisfied by either taking one year of full time teaching that is approved by the program or the following course:

- EDCI 790 - Internship in Education Credits: 1-6 credits (for 6 credits)

MEd Requirements (12 credits)

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 519 - Methods of Teaching Multilingual Students Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3

Note:
All course work, endorsements, state requirements, and tests must be finished prior to the internship. Some course work requires field experience.

Total: 30 credits

▲Concentration in Multilingual and Multicultural Education (CIMM)

This 30-credit concentration prepares professionals to work with diverse population of individuals. It provides courses for licensed teachers and the required courses for an add-on endorsement in English as a second language (ESL) PK-12, also known as English for speakers of other languages (ESOL). The program is appropriate for individuals who are not licensed and wish to complete a master's degree. Six credits of a foreign language (undergraduate or graduate level) are required but do not count toward the master's degree.

Course Work

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 519 - Methods of Teaching Multilingual Students Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 521 - Curriculum Development for Language Learners Credits: 3
- EDCI 777 - Research to Practice Credits: 3
- EDRD 525 - Emergent Literacy for English Language Learners, PK-12 Credits: 3
- EDRD 610 - Content Literacy for English Language Learners, PK-12 Credits: 3
- EDRS 590 - Education Research Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
  or
- LING 520 - Introduction to Linguistics Credits: 3
- Choose 3 credits with advisor approval

Total: 30 credits

Secondary Education (6–12)

The seven 33-credit secondary education concentrations with a licensure component are designed to meet the needs of individuals who wish to be licensed or need to satisfy the requirements of a provisional license to teach at the secondary level. Specific endorsement areas are Biology, Chemistry, Earth Science, English, History and Social Science, Mathematics, and Physics. Note: only six credits (in total) may be taken as non-degree or transferred (with coordinator approval) from another accredited institution.

The Career Switcher Program is an alternative licensure route that prepares experienced professionals for licensure as secondary school teachers with endorsements in Biology, Chemistry, Earth Science, English, History and Social Science, Mathematics, and Physics. Successful applicants must have at least five years of work experience and passing scores on the Praxis I and II, and VCLA exams. In addition, they must have completed all required endorsement courses. The program consists of six months of course work and fieldwork, followed by a closely mentored year of full-time paid classroom teaching.
Grading Policy: Students enrolled in this degree program must earn a B or higher in all course work.

Field Experience

Field experiences in public schools will be required throughout the program (a maximum of 15 clock hours per course or 30 clock hours per term). Arrangements will be made at the beginning of each term.

▲ Concentration in Secondary Education Biology (SECB)

Course Work

Licensure Requirements (21 credits)

- EDCI 573 - Teaching Science in the Secondary School Credits: 3
- EDCI 673 - Advanced Methods of Teaching Science in the Secondary School Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 619 - Literacy in Content Areas Credits: 3
- EDUC 522 - Foundations of Secondary Education Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

MEd Requirements (12 credits)

- EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom Credits: 3
- EDUC 675 - Research in Secondary Education Credits: 3

Electives

- Biology content elective (chosen with advisor’s approval) (3 credits)
- Education elective (chosen with advisor’s approval) (3 credits)

Total: 33 credits

▲ Concentration in Secondary Education Chemistry (SECC)

Course Work

Licensure Requirements (21 credits)
- EDCI 573 - Teaching Science in the Secondary School Credits: 3
- EDCI 673 - Advanced Methods of Teaching Science in the Secondary School Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 619 - Literacy in Content Areas Credits: 3
- EDUC 522 - Foundations of Secondary Education Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

**MEd Requirements (12 credits)**

- EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom Credits: 3
- EDUC 675 - Research in Secondary Education Credits: 3

**Electives**

- Chemistry content elective (chosen with advisor’s approval) (3 credits)
- Education elective (chosen with advisor’s approval) (3 credits)

**Total: 33 credits**

**Concentration in Secondary Education Earth Science (SECS)**

**Course Work**

**Licensure Requirements (21 credits)**

- EDCI 573 - Teaching Science in the Secondary School Credits: 3
- EDCI 673 - Advanced Methods of Teaching Science in the Secondary School Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 619 - Literacy in Content Areas Credits: 3
- EDUC 522 - Foundations of Secondary Education Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

**MEd Requirements (12 credits)**

- EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom Credits: 3
- EDUC 675 - Research in Secondary Education Credits: 3

**Electives**
Earth Science elective (chosen with advisor’s approval) (3 credits)
Education elective (chosen with advisor’s approval) (3 credits)

Total: 33 credits

▲ Concentration in Secondary Education English (SECE)

Course Work

Licensure Requirements (21 credits)

- EDCI 569 - Teaching English in the Secondary School Credits: 3
- EDCI 669 - Advanced Methods of Teaching English in the Secondary School Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 619 - Literacy in Content Areas Credits: 3
- EDUC 522 - Foundations of Secondary Education Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

MEd Requirements (12 credits)

- EDCI 570 - Teaching Young Adult Literacy in a Multicultural Setting Credits: 3
- EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom Credits: 3
- EDUC 675 - Research in Secondary Education Credits: 3

Electives

- Education elective, chosen with advisor’s approval (3 credits)

Total: 33 credits

▲ Concentration in Secondary Education History and Social Science (SECH)

Course Work

Licensure Requirements (21 credits)
- EDCI 567 - Teaching Social Studies in the Secondary School Credits: 3
- EDCI 667 - Advanced Methods of Teaching Social Sciences in the Secondary School Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 619 - Literacy in Content Areas Credits: 3
- EDUC 522 - Foundations of Secondary Education Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

MEd Requirements (12 credits)

- EDUC 671 - Schools and Culture in the Future Credits: 3
- EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom Credits: 3
- EDUC 675 - Research in Secondary Education Credits: 3

Electives

- History and Social Studies content elective, chosen with advisor's approval (3 credits)

Total: 33 credits

▲ Concentration in Secondary Education Mathematics (SECM)

Course Work

Licensure Requirements (21 credits)

- EDCI 572 - Teaching Mathematics in the Secondary School Credits: 3
- EDCI 672 - Advanced Methods of Teaching Mathematics in the Secondary School Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 619 - Literacy in Content Areas Credits: 3
- EDUC 522 - Foundations of Secondary Education Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

MEd Requirements (12 credits)

- EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom Credits: 3
- EDUC 675 - Research in Secondary Education Credits: 3

Electives
• Mathematics content elective, chosen with advisor’s approval (3 credits)
• Education elective, chosen with advisor’s approval (3 credits)

Total: 33 credits

▲ Concentration in Secondary Education Physics (SECP)

Course Work

Licensure Requirements (21 credits)

• EDCI 573 - Teaching Science in the Secondary School Credits: 3
• EDCI 673 - Advanced Methods of Teaching Science in the Secondary School Credits: 3
• EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
• EDRD 619 - Literacy in Content Areas Credits: 3
• EDUC 522 - Foundations of Secondary Education Credits: 3
• EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

MEd Requirements (12 credits)

• EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom Credits: 3
• EDUC 675 - Research in Secondary Education Credits: 3

Electives

• Physics content elective, chosen with advisor’s approval (3 credits)
• Education elective, chosen with advisor’s approval (3 credits)

Internship Options

A 6-credit 15-week daytime internship (EDCI 790) is required for completion of the state-approved licensure program. Three options are available to meet the needs of most individuals:

• **Professional Development School (PDS) internship:** A one-term daytime internship as a PDS intern in a school identified by secondary faculty members. Intern assumes co-teaching and independent teaching responsibilities.

• **Student teaching internship:** A one-term daytime internship in the classroom of a cooperating teacher. Intern assumes co-teaching and independent teaching responsibilities.

• **On-the-job internship:** Available only to students who are employed as full-time provisionally licensed teachers and teaching in their endorsement area in an accredited middle or secondary school and want to complete a master’s degree. In lieu of an internship, provisionally licensed teachers may choose to use their full-time teaching to satisfy the experience requirement for a full license; however, the 33-credit master’s degree requires that 6 credits of approved course work be substituted for the internship.
Total: 33 credits

Education Leadership, MEd

Banner Code: E1-MED-EDLE

This 30-credit master’s degree (24-credit licensure component and 6 additional credits) prepares candidates for leadership and management positions in a variety of educational settings. The program emphasizes an understanding of the complexities of change in schools, communities, and organizations. Participants are expected to develop and demonstrate the knowledge, skills, and dispositions necessary to create and maintain learning environments that value diversity, continual knowledge acquisition, instructional leadership, innovative and ethical decision making, reflective practice, and successful achievement of all school-aged youth.

Participants who are admitted into the MEd in Education Leadership program who already have a master's degree and three years of teaching experience may complete only the licensure course work (24-credits) for the administration and supervision PK-12 license.

Students may also complete the MEd in Education Leadership with a concentration in one of the following: Mathematics Education Leadership (K-8), Mathematics Specialist Leader (K-8), Science Education Leadership (PK-12), or Special Education Leadership.

Course Work

Licensure Requirements (24 credits)

- EDLE 610 - Leading Schools and Communities Credits: 3
- EDLE 612 - Education Law Credits: 3
- EDLE 614 - Managing Financial and Human Resources Credits: 3
- EDLE 616 - Curriculum Development and Evaluation Credits: 3
- EDLE 618 - Supervision and Evaluation of Instruction Credits: 3
- EDLE 620 - Organizational Theory and Leadership Credits: 3
- EDLE 690 - Using Research to Lead School Improvement Credits: 3
- EDLE 791 - Internship in Educational Leadership Credits: 3

Internship

The internship is integral to the Education Leadership degree and provides an opportunity to synthesize and apply the knowledge and practice the skills identified in the Educational Leadership Constituency Consortium Standards through substantial, sustained work in educational settings.

Prerequisites

All licensure course work listed above
MEd Requirements (6 credits)

- EDLE 634 - Contemporary Issues in Education Leadership Credits: 3
- EDLE 636 - Adult Motivation and Conflict Management in Education Settings: A Case Study Approach Credits: 3

Total: 30 credits

▲ Concentration in Mathematics Education Leadership (K-8) (EDML)

This 33-credit concentration in Mathematics Education Leadership (K-8) prepares individuals for master teacher, lead teacher, or school-wide leadership positions in elementary or middle school mathematics. Course work includes study or experiences in educational leadership, mathematics teaching and learning, instructional technology, and curriculum development. Program participants study and use research that has significant positive effects on professional development and teaching and learning mathematics. Program experiences prepare students to select, develop, and implement school-based curricula and teaching and learning materials, as well as in-service and professional development programs for teachers. The internship in an individual experience designed and developed in consultation with a faculty advisor or mentor.

Course Work

- EDCI 644 - Mathematics Learning and Assessment (K-8) Credits: 3
- EDCI 645 - Curriculum Development in Mathematics Education Credits: 3
- EDCI 646 - Mathematics Education Leadership for School Change Credits: 1-3 (Must register for 3 credits)
- EDCI 663 - Research in Science Teaching Credits: 3
- EDCI 666 - Research in Mathematics Teaching Credits: 3
- EDCI 705 - Instructional Design Credits: 3
- EDIT 704 - Instructional Technology Foundations and Theories of Learning Credits: 3
- EDLE 618 - Supervision and Evaluation of Instruction Credits: 3
- EDLE 791 - Internship in Educational Leadership Credits: 3

Electives

- Mathematics Elective (3 credits)
- Technology Elective (3 credits)

Total: 33 credits

▲ Concentration in Mathematics Specialist Leader (K–8) (MSLR)

This 30-credit Mathematics Specialist Leader (K-8) concentration is designed for working professionals. Students study mathematics content and pedagogy, teaching, curriculum and professional development. They also explore school-based leadership issues in mathematics education. The internship is an individual experience designed and developed in consultation...
with a faculty advisor or mentor. This program includes all course work required for Virginia state licensure as a K-8 mathematics specialist. Students who apply for this licensure must have three years of successful teaching experience in addition to the MEd degree.

Course Work

- EDCI 644 - Mathematics Learning and Assessment (K-8) Credits: 3
- EDCI 645 - Curriculum Development in Mathematics Education Credits: 3
- EDCI 646 - Mathematics Education Leadership for School Change Credits: 1-3 (Must register for 3 credits)
- EDCI 666 - Research in Mathematics Teaching Credits: 3
- EDLE 791 - Internship in Educational Leadership Credits: 3
- MATH 610 - Number Systems and Number Theory for K-8 Teachers Credits: 3
- MATH 611 - Geometry and Measurement for K-8 Teachers Credits: 3
- MATH 612 - Probability and Statistics for K-8 Teachers Credits: 3
- MATH 613 - Algebra and Functions for K-8 Teachers Credits: 3
- MATH 614 - Rational Numbers and Proportional Reasoning for K-8 Teachers Credits: 3

Total: 30 credits

▲Concentration in Science Education Leadership (PK-12) (EDSL)

This 30-credit concentration in Science Education Leadership (PK-12) focuses on education leadership and science teaching and learning. Students study the changing nature of science, science teaching, assessment, curriculum, technology, safety, and meeting the diverse needs of learners. Students also develop skills in science teaching and learning, data-driven decision making, systematic and continual improvement, and leading dynamic organizations. Internship experiences include working with a practicing scientist in a research setting and interacting with school leaders at the state and local levels who directly and indirectly influence science education. This program includes all course work required for Virginia licensure in administration and supervision (PK-12). This concentration is designed for those persons who have taught for three years and are seeking a master's degree. They will receive their Virginia administrative license and MEd in Education Leadership after they have completed the required coursework, and pass the administrative licensure exam that meets Virginia requirements. This is not an initial teacher licensure program.

Course Work

- EDCI 663 - Research in Science Teaching Credits: 3
- EDCI 666 - Research in Mathematics Teaching Credits: 3
- EDCI 683 - Curriculum Development and Evaluation in Science Education Credits: 3
- EDCI 693 - Leadership and Organizational Issues in Science Education Credits: 3
- EDLE 612 - Education Law Credits: 3
- EDLE 614 - Managing Financial and Human Resources Credits: 3
- EDLE 618 - Supervision and Evaluation of Instruction Credits: 3
- EDLE 620 - Organizational Theory and Leadership Credits: 3
- EDLE 791 - Internship in Educational Leadership Credits: 3
Electives

- Technology Elective (3 credits)

Total: 30 credits

▲Concentration in Special Education Leadership (SELE)

This 30-credit Special Education Leadership concentration (24-credit licensure component and 6 additional credits) is designed to provide training for educators who administer program implementation efforts for learners with exceptional needs. It is appropriate for those who have an interest in becoming special education directors, program coordinators, school building administrators, department chairs, or lead teachers; however, opportunities beyond special education also exist.

Participants who are admitted into the MEd in Education Leadership program who already have a master’s degree and three years of teaching experience may complete only the licensure course work (24-credits) for the administration and supervision PK-12 license.

Licensure Requirements (24 credits)

- EDLE 610 - Leading Schools and Communities Credits: 3
- EDLE 612 - Education Law Credits: 3
- EDLE 618 - Supervision and Evaluation of Instruction Credits: 3
- EDLE 791 - Internship in Educational Leadership Credits: 3
- EDSE 626 - The Inclusive Classroom Credits: 3
- EDLE 690 - Using Research to Lead School Improvement Credits: 3
- EDSE 702 - Managing Resources for Special Education Programs Credits: 3
- EDSE 743 - Leadership in Special Education Administration Credits: 3

MEd Requirements (6 credits)

- EDSE 701 - Legal Issues and Special Populations Credits: 3
  or
- EDSE 703 - Creating a Collaborative Culture Credits: 3
- EDSE 744 - Current Issues in Special Education Credits: 3

Total: 30 credits

Educational Psychology, MS

Banner Code: E1-MS-EDP
This 30-credit master’s program is designed to offer professionals and students the opportunity to apply principles of learning, cognition, and motivation to vital problems in the area of education; develop a solid understanding of research, assessment, and evaluation methodologies; and develop an analytical and scholarly approach to critically assessing theoretical perspectives, research, and practice within and across content domains. By participating in a supportive and collegial environment with faculty from numerous educational disciplines and expertise, students are expected to develop the skills to meet the needs of diverse populations and design and implement effective educational programs appropriate for a broad range of cultural contexts.

Degree Requirements

Students pursuing the master's degree in Educational Psychology must complete a minimum of 30 credits in one of three concentrations. Each concentration offers students the option of a thesis or a project to fulfill the research requirement.

▲ Concentration in Assessment, Evaluation, and Testing (EDPA)

Course Work

- EDRS 630 - Educational Assessment Credits: 3

  Take one of the following for 3 credits:
  - EDEP 798 - Directed Reading, Research, and Individual Projects in Educational Psychology Credits: 1-3
  - EDEP 799 - Thesis in Educational Psychology Credits: 1-3

  Choose six credits from the following:
  - EDEP 650 - High-Stakes Assessment and Accountability Systems Credits: 3
  - EDEP 651 - Modern Measurement with Applications in Education and the Behavioral Sciences Credits: 3
  - EDRS 631 - Program Evaluation Credits: 3
  - EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
    Focus on research methodology assessment, evaluation, and/or testing
  - PSYC 541 - Survey Research Credits: 3
  - PSYC 557 - Psychometric Methods Credits: 3

Educational Psychology Core (9 credits)

- EDEP 550 - Theories of Learning and Cognition Credits: 3
- EDEP 551 - Principles of Learner Motivation Credits: 3

  Choose three credits from the following:
  - EDUC 539 - Human Development and Learning PK-12 Credits: 3
  - EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
    Focus on human development
  - EDUC 672 - Human Development and Learning: Secondary Education Credits: 3
  - PSYC 666 - Cognitive and Perceptual Development Credits: 3
Research Methodology Core (9 credits)

- EDRS 531 - Educational and Psychological Measurement Credits: 3
- EDRS 620 - Quantitative Inquiry in Education Credits: 3
- EDRS 621 - Qualitative Inquiry in Education Credits: 3

Total: 30 credits

▲ Concentration in Learning, Cognition, and Motivation (EDPL)

Course Work

- EDEP 652 - Process of Learning and Development Credits: 3

  Take one of the following for 3 credits:

  - EDEP 798 - Directed Reading, Research, and Individual Projects in Educational Psychology Credits: 1-3
  or
  - EDEP 799 - Thesis in Educational Psychology Credits: 1-3

  Choose two courses from the following:

  - EDEP 653 - Culture and Intelligence Credits: 3
  - EDEP 654 - Learning, Motivation, and Self-Regulation Credits: 3
  - EDEP 655 - The Neuroscience of Learning and Cognition Credits: 3
  - EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)

Educational Psychology Core (9 credits)

- EDEP 550 - Theories of Learning and Cognition Credits: 3
- EDEP 551 - Principles of Learner Motivation Credits: 3

  Choose three credits from the following:

  - EDUC 539 - Human Development and Learning PK-12 Credits: 3
  - EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
  
    Focus on human development
  - EDUC 672 - Human Development and Learning: Secondary Education Credits: 3
  - PSYC 666 - Cognitive and Perceptual Development Credits: 3

Research Methodology Core (9 credits)

- EDRS 531 - Educational and Psychological Measurement Credits: 3
- EDRS 620 - Quantitative Inquiry in Education Credits: 3
• EDRS 621 - Qualitative Inquiry in Education Credits: 3

Total: 30 credits

▲Concentration in Teacher Preparation (EDPT)

Individuals pursuing the MS in Educational Psychology with a concentration in Teacher Preparation must be admitted into one of the following teacher licensure certificate programs prior to completion of MS course work: English as a Second Language, Secondary Education, Students with Disabilities who Access the General Curriculum, Students with Disabilities who Access the Adapted Curriculum, or Visual Impairments. Students apply three courses (9 credits) from within one of the above mentioned teacher licensure certificate programs toward their MS degree in Educational Psychology with the expectation that they will complete the teacher certification program.

Course Work

• Three courses (9 credits) from teacher licensure certificate program (see above).
  Take one of the following for 3 credits:
  • EDEP 798 - Directed Reading, Research, and Individual Projects in Educational Psychology Credits: 1-3
  or
  • EDEP 799 - Thesis in Educational Psychology Credits: 1-3

Educational Psychology Core (9 credits)

• EDEP 550 - Theories of Learning and Cognition Credits: 3
• EDEP 551 - Principles of Learner Motivation Credits: 3

Choose three credits from the following:
• EDUC 539 - Human Development and Learning PK-12 Credits: 3
• EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
  Focus on human development
• EDUC 672 - Human Development and Learning: Secondary Education Credits: 3
• PSYC 666 - Cognitive and Perceptual Development Credits: 3

Research Methodology Core (9 credits)

• EDRS 531 - Educational and Psychological Measurement Credits: 3
• EDRS 620 - Quantitative Inquiry in Education Credits: 3
• EDRS 621 - Qualitative Inquiry in Education Credits: 3

Total: 30 credits
New Professional Studies, MA

Banner Code:  E1-MA-NPST

This 30-credit hour master's degree engages experienced Pre-K-12 teachers to enhance their teaching and leadership skills as critically reflective educators who create vibrant and effective learning environments in their classrooms and schools. Graduate course work is linked to school-based issues for teachers. Class days are designed to complement a teacher's schedule during the summer and school year. Specific information is available from the Initiatives in Educational Transformation (IET) web site, gse.gmu.edu/iet, or calling 703-993-8320.

▲ Concentration in Teaching (PSTT)

Course Work

- EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
- IETT 750 - Studies in Language and Culture I Credits: 3
- IETT 751 - Studies in Language and Culture II Credits: 3
- IETT 752 - Research in Practice: The Team Project Credits: 6
- IETT 753 - Teaching and Learning Credits: 3
- MNPE 700 - The New Professionalism: Theory and Practice Credits: 3
- MNPE 702 - The New Professional as a Reflective Practitioner Credits: 3
- MNPE 703 - Technology and Learning in the New Professions Credits: 3
- MNPE 704 - Research Methodologies in the New Professionalism Credits: 3

Total: 30 credits

Special Education, MEd

Banner Code:  E1-MED-EDSE

This 30-credit program leads to a master's degree for professionals who already hold a special education teacher license or are interested in working in a special education context outside the classroom.

Students who wish to focus their program on a specific area in the field are advised to consider completing a licensure or non-licensure certificate program in conjunction with the MEd. Students may use their certificate coursework to fulfill the elective credits for the MEd degree program.

Degree Requirements

MEd Course Work (15 credits)
• EDSE 501 - Introduction to Special Education Credits: 3
• EDSE 503 - Language Development and Reading Credits: 3
or
• EDSE 557 - Foundations of Language and Literacy for Diverse Learners Credits: 3
• EDSE 517 - Computer Applications for Special Populations Credits: 3
• EDSE 590 - Special Education Research Credits: 3
• EDSE 662 - Consultation and Collaboration Credits: 3

Electives (15 credits)

• Choose 15 credits from graduate EDSE-prefix courses

Total: 30 credits

▲Concentration in Early Childhood Special Education (Non-licensure) (SPEC)

This 30-credit concentration is for professionals who already hold an early childhood special education teacher license or are interested in working in an early childhood special education context outside the classroom. Students who wish to seek early childhood education licensure are advised to consider completing the Early Childhood Special Education Licensure certificate program in conjunction with the MEd. Students may use their certificate coursework to fulfill the elective credits for the MEd degree program.

MEd Course Work (18 credits)

• ECED 502 - Foundations of Language and Literacy for Diverse Young Learners Credits: 3
• ECED 505 - Introduction to Early Childhood Special Education Credits: 3
• ECED 524 - Families of Children with Special Needs Credits: 3
• ECED 585 - Research in Early Childhood Education Credits: 3
or
• EDSE 590 - Special Education Research Credits: 3
• ECED 601 - Frameworks for Early Childhood Education Credits: 3
• EDSE 517 - Computer Applications for Special Populations Credits: 3

Note:

A professional portfolio is required. The portfolio reflects the student's professional development throughout the program and contains examples of performance assessments associated with standards.

Electives (12 credits)
Choose 12 credits from graduate ECED- or EDSE-prefix courses

Total: 30 credits

Master's Level Certificate

Applied Behavior Analysis Graduate Certificate

Banner Code: E1-CERG-ABAC

This 15-credit non-licensure certificate is designed to increase the professional training of individuals responsible for designing, implementing, and monitoring behavioral treatment programs in schools, agencies (such as psychiatric hospitals), and training centers for people with severe disabilities.

The graduate certificate in Applied Behavior Analysis may be pursued on a part-time basis only unless students complete the certificate in conjunction with the optional internship. With internship the program may be pursued on a full-time basis.

Certificate Requirements

- EDSE 619 - Applied Behavior Analysis: Principles, Procedures, and Philosophy Credits: 3
- EDSE 621 - Applied Behavior Analysis: Empirical Bases Credits: 3
- EDSE 623 - Applied Behavior Analysis: Assessments and Interventions Credits: 3
- EDSE 624 - Applied Behavior Analysis: Applications Credits: 3
- EDSE 625 - Applied Behavior Analysis: Verbal Behavior Credits: 3

Note

EDSE 790 - Internship in Special Education may be taken to meet the Behavior Analysis Certification Board (BACB) supervised practicum requirements.

Total: 15 credits

ASTL: Literacy: Reading Specialist Graduate Certificate

Banner Code: E1-CERG-ALRS

This 21-credit certificate, a state-approved (Virginia) sequence of courses leading to reading specialist licensure, is designed for teachers who have a master’s degree. Course work includes foundational knowledge, instructional and assessment strategies for
individuals and groups, and preparation as a literacy coach and staff developer. Licensure also requires a master’s degree, passing the Virginia Reading Assessment, and three years of teaching under contract.

The graduate certificate in ASTL: Literacy: Reading Specialist may only be pursued on a part-time basis.

Certificate Requirements

- EDRD 630 - Advanced Literacy Foundations and Instruction, Birth to Middle Childhood Credits: 3
- EDRD 631 - Advanced Literacy Foundations and Instruction, Adolescence through Adulthood Credits: 3
- EDRD 632 - Literacy Assessments and Interventions for Groups Credits: 3
- EDRD 633 - Literacy Assessments and Interventions for Individuals Credits: 3
- EDRD 634 - School-Based Leadership in Literacy Credits: 3
- EDRD 635 - School-Based Inquiry in Literacy Credits: 3
- EDRD 637 - Supervised Literacy Practicum Credits: 2-3 (must register for 3 credits)

Total: 21 credits

Counseling Licensure Post-Master's Graduate Certificate

Banner Code: E1-CERG-PCLC

This 15-credit certificate is designed for individuals who possess a master's degree in counseling or a highly-related field and seek 15 credits of post-graduate coursework to meet licensure requirements as a Virginia School Counselor or Virginia Licensed Professional Counselor. Applicants with master's degrees outside of counseling who would like to meet licensure requirements as a Virginia Licensed Professional Counselor, must verify course equivalency with the Virginia Board of Counseling (see Board of Counseling content area list at http://www.dhp.state.va.us/counseling/). Applicants with more than seven courses to take to meet the course content requirements for licensure must apply to one of our master's degree programs.

Once accepted into the post master's graduate certificate program, students individually tailor their coursework with an advisor to meet licensure requirements and may enroll for the courses listed below or other core program courses as needed.

The graduate certificate in Counseling Licensure Post-Master's may only be pursued on a part-time basis.

Certificate Requirements

Virginia School Counselor

Choose 15 credits from the following Virginia School Counseling courses listed below. Students studying for the M.Ed in Counseling and Development may also meet Virginia School Counselor licensure requirements through coursework offered under the M.Ed in Counseling and Development School Counseling PK-12 concentration of study.

- EDCD 606 - Counseling Children and Adolescents Credits: 4
- EDCD 611 - Introduction to Ethical and Legal Issues in School Counseling Credits: 2
- EDCD 626 - Principles and Practices of School Counseling Credits: 3
- EDCD 755 - Practicum in Counseling Credits: 3
- EDCD 791 - Internship in Counseling Credits: 3
- EDCD 797 - Advanced Topics in Education Credits: 1-6

Total: 15 credits

Licensed Professional Counselor

Choose 15 credits from the following Licensed Professional Counselor courses listed below. Students studying for the M.Ed in Counseling and Development may also meet Virginia Licensed Professional Counselor licensure requirements through coursework offered under the M.Ed in Counseling and Development Community Agency Counseling concentration of study.

- EDCD 609 - Advanced Counseling Skills and Strategies Credits: 4
- EDCD 652 - Introduction to Substance Abuse Counseling Credits: 3
- EDCD 654 - Counseling, Ethics, and Consultation in Community Agencies Credits: 3
- EDCD 656 - Diagnosis and Treatment Planning for Mental Health Professionals Credits: 3
- EDCD 658 - Couples and Family Counseling Credits: 3
- EDCD 755 - Practicum in Counseling Credits: 3
- EDCD 791 - Internship in Counseling Credits: 3
- EDCD 797 - Advanced Topics in Education Credits: 1-6

Total: 15 credits

Data-Driven Decision-Making for Continuous Educational Improvement Graduate Certificate

Banner Code: E1-CERG-DDDM

This 12-credit certificate prepares teachers and building and district-level leaders to analyze and interpret a variety of student performance assessments in order to improve instruction and student learning. The four carefully sequenced courses for the certificate focus on developing meaningful teacher-created and classroom-based student assessments, interpreting both informal and formal assessment data, and using those data in making curricular decisions. Practicing teachers and other school leaders will have the opportunity to apply assessment and decision-making skills to their own classrooms or schools. Credits earned for the certificate may be applied toward the Master’s of Science degree in Educational Psychology.

The graduate certificate in Data-Driven Decision-Making for Continuous Educational Improvement may only be pursued on a part-time basis.

Certificate Requirements
• EDEP 591 - Data-Driven Decision Making for Continuous Educational Improvement Credits: 3
• EDEP 592 - Data-Driven Decision-Making: Development of Assessments Credits: 3
• EDEP 593 - Data-Driven Decision Making: Analysis and Interpretation of Assessment Data Credits: 3
• EDEP 594 - Data-Driven Decision-Making Application in Education Contexts Credits: 3

Total: 12 credits

E-Learning Graduate Certificate

Banner Code: E1-CERG-ELRN

This 15-credit certificate provides professionals with specialized knowledge in instructional design and e-learning practices that utilize current and emerging technologies to meet education and training goals in schools, communities, government agencies, and corporate settings. Courses are available online to meet the needs of students who find it difficult to attend our face-to-face courses.

The graduate certificate in E-Learning may only be pursued on a part-time basis.

Certificate Requirements

• EDIT 526 - Web Accessibility and Design Credits: 3
• EDIT 611 - Innovations in Distance Learning Credits: 3
• EDIT 705 - Instructional Design Credits: 3

Electives

E-Learning elective courses are offered for variable credit each semester and cover industry-standard commercial and open source software tools.

Select 6 credits from the following:

• EDIT 530 - Scripting and Programming Credits: 2
• EDIT 571 - Tools for Visual/Graphic Design Credits: 1-3
• EDIT 572 - Tools for Digital Video and Audio Credits: 1-3
• EDIT 573 - Project Management Tools Credits: 1-3
• EDIT 574 - Networking Tools Credits: 1-3
• EDIT 575 - Authoring Tools Credits: 1-3
• EDIT 771 - Overview of Digital Media Credits: 1-3
• EDIT 772 - Web-Based Instructional Tools Credits: 1-3
Total: 15 credits

**Early Childhood Education PK-3 (Licensure) Graduate Certificate**

Banner Code: E1-CERG-EPK3

This 30-credit hour certificate offers required coursework for teacher licensure in Early Childhood Education PK-3. Students who have completed graduate or undergraduate coursework prior to admission to this graduate certificate program may request that courses in this program be waived based on prior coursework. Students who are eligible to waive coursework must complete a minimum of 15 credits to graduate with the Early Childhood Education PK-3 Graduate Certificate.

The graduate certificate in Early Childhood Education PK-12 (Licensure) may be pursued on a part-time or full-time basis.

**Certificate Requirements**

- ECED 501 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3
- ECED 502 - Foundations of Language and Literacy for Diverse Young Learners Credits: 3
- ECED 503 - Inclusive Curriculum for Young Learners; Planning Instruction and Guidance Credits: 3
- ECED 504 - Families, Communities, and Schools Credits: 3
- ECED 511 - Assessment of Diverse Young Learners Credits: 3
- ECED 512 - Language and Literacy Assessment and Instruction for Diverse Young Learners Credits: 3
- ECED 513 - Curriculum Across the Content Areas for Diverse Young Learners Credits: 3
- ECED 514 - Mathematics and Science for Diverse Young Learners Credits: 3
- ECED 790 - Internship in Early Childhood Education Credits: 1-6
  - Two internship experiences required. Register for 3 credits of preschool internship; register for 3 credits of K-3 internship.

**Portfolio Requirement**

A professional portfolio is required. The portfolio reflects the student's professional development throughout the program and contains examples of performance assessments associated with standards.

Total: 30 credits

**Early Childhood Special Education (Licensure) Graduate Certificate**

Banner Code: E1-CERG-SPEC
This 36-credit certificate offers required coursework for teacher licensure in Early Childhood Special Education. Students who have completed graduate or undergraduate coursework prior to admission to this graduate certificate program may request that courses in this program be waived based on prior coursework. Students who are eligible to waive coursework must complete a minimum of 15 credits to graduate with the Early Childhood Special Education Graduate Certificate.

The graduate certificate in Early Childhood Special Education (Licensure) may be pursued on a part-time or full-time basis.

Certificate Requirements

- ECED 501 - Developmental Pathways of Diverse Learners, Birth-Adolescence Credits: 3
- ECED 502 - Foundations of Language and Literacy for Diverse Young Learners Credits: 3
- ECED 503 - Inclusive Curriculum for Young Learners: Planning Instruction and Guidance Credits: 3
- ECED 505 - Introduction to Early Childhood Special Education Credits: 3
- ECED 506 - Medical Aspects of Physical and Sensory Disabilities of Diverse Young Learners Credits: 3
- ECED 521 - Family-Centered Assessment of Diverse Young Learners Credits: 3
- ECED 522 - Developing Language, Literacy, and Communication of Diverse Young Learners Credits: 3
- ECED 523 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches Credits: 3
- ECED 524 - Families of Children with Special Needs Credits: 3
- ECED 591 - Policy Perspectives in Early Childhood Education Credits: 3
- ECED 791 - Internship in Early Childhood Special Education Credits: 1-6 (total 6 credits)
  Two internship experiences required. Register for 3 credits of preschool internship; register for 3 credits of infant/toddler internship.

Portfolio Requirement

A professional portfolio is required. The portfolio reflects the student's professional development throughout the program and contains examples of performance assessments associated with standards.

Total: 36 credits

English as a Second Language (ESL/ESOL)/Special Education Graduate Certificate

Banner Code: E1-CERG-ELSE

This 18-credit certificate offers coursework for students and professionals seeking crossover training in ESL/ESOL and special education.

The graduate certificate in English as a Second Language (ESL/ESOL)/Special Education may only be pursued on part-time basis.
Certificate Requirements

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 519 - Methods of Teaching Multilingual Students Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDSE 501 - Introduction to Special Education Credits: 3
  or
- EDSE 540 - Characteristics of Students with Disabilities who Access the General Curriculum Credits: 3
- EDSE 503 - Language Development and Reading Credits: 3
- EDSE 626 - The Inclusive Classroom Credits: 3
  or
- EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum Credits: 3
  or
- EDSE 629 - Secondary Curriculum and Strategies for Students with Disabilities who Access the General Curriculum Credits: 3

Total: 18 credits

English as a Second Language (Licensure) Graduate Certificate

Banner Code: E1-CERG-CISL

This 30-credit certificate offers course work leading to teacher licensure (Virginia) in English as a Second Language. Candidates whose first language is not English may be required to pass an oral and written proficiency assessment in English to meet state licensure requirements and national professional standards.

Prerequisite for admission: Six credits of a modern foreign language. Course work may be taken at either the graduate or undergraduate level and does not count towards meeting the total credit hour requirement for the certificate.

The graduate certificate in English as a Second Language (Licensure) may only be pursued on part-time basis.

Certificate Requirements

- EDCI 510 - Linguistics for PreK-12 ESOL Teachers Credits: 3
- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 519 - Methods of Teaching Multilingual Students Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 525 - Emergent Literacy for English Language Learners, PK-12 Credits: 3
- EDRD 610 - Content Literacy for English Language Learners, PK-12 Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
• EDUC 539 - Human Development and Learning PK-12 Credits: 3

Total: 30 credits

FAST TRAIN Advanced International Baccalaureate (Studies) Graduate Certificate

Banner Code: E1-CERG-ADIB

This 15-credit certificate provides advanced professional development for teachers on the philosophy, elements, and assessments of the Primary Years Programme (PYP), Middle Years Programme (MYP), and Diploma Programme (DP). The course work focuses on the theory, pedagogy, and research under girding the International Baccalaureate programs.

The graduate certificate in FAST TRAIN Advanced International Baccalaureate (Studies) may be pursued on a part-time or full-time basis.

Certificate Requirements

• EDUC 621 - Teaching and Learning in the International Baccalaureate Primary Years Program Credits: 3
• EDUC 622 - Curriculum Development across IB Programs Credits: 3
• EDUC 623 - Models and Strategies for Teaching and Learning in IB Schools Credits: 3
• EDUC 624 - Assessment and Learning in IB Schools Credits: 3
• EDUC 626 - Inquiry into Action: IB Teachers, Learners, and Schools Credits: 3

Note:

Upon completion of all requirements and documentation of one year of teaching in an IB authorized school, candidates are eligible for the Teacher Award Level I through IB.

Total: 15 credits

FAST TRAIN Special Education Graduate Certificate

Banner Code: E1-CERG-SPFT

This 15-credit certificate is designed for pre-service and in-service international teacher educators who desire additional training in special education. All course work may be applied to the MEd in Special Education and will count towards Virginia licensure in special education K-12.

The graduate certificate in FAST TRAIN Special Education may only be pursued on a part-time basis.
Certificate Requirements

- EDSE 501 - Introduction to Special Education Credits: 3
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3
- EDSE 540 - Characteristics of Students with Disabilities who Access the General Curriculum Credits: 3
- EDSE 627 - Assessment Credits: 3
- EDSE 662 - Consultation and Collaboration Credits: 3

Note:

Most course work has some field experience component

Total: 15 credits

Foreign Language Licensure Graduate Certificate

Banner Code: E1-CERG-FLNC

This 27-credit certificate offers course work for teacher licensure to students enrolled in non-licensure graduate programs at Mason.

The graduate certificate in Foreign Language Licensure may only be pursued on a part-time basis.

Certificate Requirements

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 560 - Methods of Teaching in Foreign/World Languages Credits: 3
- EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools Credits: 3
- EDCI 790 - Internship in Education Credits: 1-6 (must register for 6 credits)
- EDRD 620 - Reading/Writing in Foreign/World Languages Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3

Total: 27 credits

Gifted Child Education Graduate Certificate
Banner Code: E1-CERG-AGCE

This 21-credit certificate is designed for professionals who are interested in working with gifted children. Students completing this certificate fulfill the requirements for add-on endorsement in gifted education for currently licensed teachers.

The graduate certificate in Gifted Child Education may only be pursued on a part-time basis.

Certificate Requirements

- EDCI 621 - Introduction to Gifted and Talented Learners Credits: 3
- EDCI 622 - Curriculum Differentiation for Diverse Learners Credits: 3
- EDCI 623 - Models and Strategies for Teaching Gifted Learners Credits: 3
- EDCI 624 - Assessment, Identification, and Evaluation of Gifted Learners Credits: 3
- EDCI 625 - Contemporary Issues and Trends in Gifted Education Credits: 3
- EDCI 626 - Action Research in Gifted Education Credits: 3
- EDCI 627 - Advanced Practicum in Gifted Education Credits: 3

Note

One year of successful full-time teaching in an accredited public or non-public school may be accepted in lieu of the EDCI 627 - Practicum (VA Licensure Regulations for School Personnel, 1998).

Total: 21 credits

IT - Assistive Technology Graduate Certificate

Banner Code: E1-CERG-IAST

This 15-credit certificate provides supplemental training for practitioners, families, and caregivers who use assistive technology while working with people with disabilities. The certificate is appropriate for general and special educators, related service personnel, adult service providers, and families and caregivers who need to apply assistive technology solutions within their specific discipline or school, work, home, or community setting.

The graduate certificate in IT - Assistive Technology may be pursued on a part-time or full-time basis.

Certificate Requirements

- EDSE 510 or EDIT 510 - Introduction to Assistive Technology Credits: 3
- EDSE 610 - Designing Adaptive Environments Credits: 2

Electives
Assistive Technology elective courses are offered for variable credit each semester. Select 10 credits to meet the elective requirement from the following:

- EDIT 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3
- EDIT 523 or EDSE 523 - Accessibility/Input Modification Credits: 1-3
- EDIT 524 or EDSE 524 - Assistive Technology for Individuals with Learning Disabilities Credits: 2
- EDIT 525 or EDSE 525 - Software for Individuals with Special Needs Credits: 1-2
- EDIT 526 or EDSE 526 - Web Accessibility and Design Credits: 3
- EDIT 529 or EDSE 529 - Internet as an Assistive Technology Tool Credits: 2
- EDIT 797 - Advanced Topics in Education Credits: 1-6
- EDSE 527 - Adapted Sports, Recreation, and Leisure Credits: 1
- EDSE 528 - Low-Tech Assistive Technology Solutions Credits: 1
- EDSE 534 - Communication and Severe Disabilities Credits: 3
- EDSE 622 - Augmentative Communication Credits: 2
- EDUC 600 - Workshop in Education Credits: 1-6

Total: 15 credits

**IT - Integration of Technology in Schools Graduate Certificate**

**Banner Code:** E1-CERG-IITS

This 15-credit certificate is offered to teachers who wish to gain the necessary knowledge and skills for integrating technology into the K–12 curriculum. It is designed to fulfill state-mandated technology competencies for teachers.

The graduate certificate in IT - Integration of Technology in Schools may only be pursued on a part-time basis.

**Certificate Requirements**

- EDCI 714 - Methods of Integration Credits: 3
- EDIT 561 - Teaching with Telecommunications Credits: 1
- EDIT 562 - Teaching with Databases Credits: 1
- EDIT 563 - Teaching with Graphics Credits: 1
- EDIT 564 - Teaching with Web 2.0 Credits: 2
- EDIT 565 - Teaching with Educational Software Credits: 1
- EDIT 566 - Teaching with Multimedia/Hypermedia Credits: 2
- EDIT 567 - Teaching with Desktop Publishing Credits: 2
- EDIT 568 - Teaching with the Web Credits: 2

Total: 15 credits
NPST: Teaching Historic Places with Diverse Populations Graduate Certificate

Banner Code: E1-CERG-ITHP

This one-year 15-credit graduate certificate cohort program offered by Initiatives in Educational Transformation (IET) supports experienced history/social studies teachers and park rangers to develop skills as critically reflective history educators who continually rethink the routines and assumptions that shape their work with diverse populations. Class days are designed to complement a teacher's schedule during the summer and school year. Specific information is available from the Initiatives in Educational Transformation web site, or calling 703-993-8320.

The graduate certificate in NPST: Teaching Historic Places with Diverse Populations may only be pursued on a part-time basis.

Certificate Requirements

- IETT 750 - Studies in Language and Culture I Credits: 3
- IETT 754 - Introduction to Teaching Historic Places with Diverse Populations Credits: 1
- IETT 755 - Advanced Teaching Historic Places with Diverse Populations Credits: 2
- MNPE 700 - The New Professionalism: Theory and Practice Credits: 3
- MNPE 703 - Technology and Learning in the New Professions Credits: 3
- MNPE 704 - Research Methodologies in the New Professionalism Credits: 3

Total: 15 credits

NPST: Transformative Teacher Leadership Graduate Certificate

Banner Code: E1-CERG-ITTL

This one-year 15-credit graduate certificate cohort program offered by Initiatives in Educational Transformation (IET) supports experienced Pre-K-12 teachers to develop skills and dispositions as critically reflective educators and teacher leaders who continually examine and rethink the routines and assumptions that shape their work. Class days are designed to complement a teacher's schedule during the summer and school year. Specific information is available from the Initiatives in Educational Transformation web site, or calling 703-993-8320.

The graduate certificate in NPST: Transformative Teacher Leadership may only be pursued on a part-time basis.

Certificate Requirements

- EDUC 597 - Special Topics in Education Credits: 1-6 (Must register for 3 credits)
- IETT 750 - Studies in Language and Culture I Credits: 3
- MNPE 700 - The New Professionalism: Theory and Practice Credits: 3
- MNPE 703 - Technology and Learning in the New Professions Credits: 3
- MNPE 704 - Research Methodologies in the New Professionalism Credits: 3

Total: 15 credits

**Online Academy for Teachers Graduate Certificate**

**Banner Code:** E1-CERG-OTUC

This 15-credit certificate is for teachers who want to gain the necessary knowledge and skills to teach students in virtual environments.

The graduate certificate in Online Academy for Teachers may only be pursued on a part-time basis.

**Certificate Requirements**

- EDCI 714 - Methods of Integration Credits: 3
- EDIT 611 - Innovations in Distance Learning Credits: 3
- EDIT 641 - Understanding Virtual Schools Credits: 1
- EDIT 642 - The Online Academy Credits: 1
- EDIT 643 - Online Mentoring I: Building Virtual Relationships Credits: 1
- EDIT 644 - Online Mentoring II: Promoting Self-Regulation Credits: 1
- EDIT 645 - Online Mentoring III: Conceptual Learning Credits: 1
- EDIT 646 - Online Mentoring IV: Moderating Credits: 2
- EDIT 790 - Practicum in Instructional Technology Credits: 1-6 (Must register for 2 credits)

Total: 15 credits

**Secondary Education Licensure Graduate Certificate**

**Banner Code:** E1-CERG-SELC

This 21-credit certificate offers course work towards teacher licensure (Virginia) to students enrolled in non-licensure graduate programs at Mason or those who already have a master’s degree.

The graduate certificate in Secondary Education Licensure may be pursued on a part-time or full-time basis.

**Certificate Requirements**
Core (15 credits)

- EDCI 790 - Internship in Education Credits: 1-6 (Must register for 6 credits)
- EDRD 619 - Literacy in Content Areas Credits: 3
- EDUC 522 - Foundations of Secondary Education Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

Curriculum and Methods (3 credits)

Choose one content course specific to your program from the following:

- EDCI 567 - Teaching Social Studies in the Secondary School Credits: 3
- EDCI 569 - Teaching English in the Secondary School Credits: 3
- EDCI 572 - Teaching Mathematics in the Secondary School Credits: 3
- EDCI 573 - Teaching Science in the Secondary School Credits: 3

Advanced Curriculum and Methods (3 credits)

Choose one content course specific to your program from the following:

- EDCI 667 - Advanced Methods of Teaching Social Sciences in the Secondary School Credits: 3
- EDCI 669 - Advanced Methods of Teaching English in the Secondary School Credits: 3
- EDCI 672 - Advanced Methods of Teaching Mathematics in the Secondary School Credits: 3
- EDCI 673 - Advanced Methods of Teaching Science in the Secondary School Credits: 3

Total: 21 credits

Special Education Leadership Graduate Certificate

Banner Code: E1-CERG-SELE

This 15-credit non-licensure certificate provides training for educators who administer program implementation efforts for learners with exceptional needs. It is designed for those who have an interest in becoming special education directors, program coordinators, school building administrators, department chairs, or lead teachers; however, opportunities beyond special education also exist.

The graduate certificate in Special Education Leadership may only be pursued on a part-time basis.

Certificate Requirements
EDSE 743 - Leadership in Special Education Administration Credits: 3
EDSE 744 - Current Issues in Special Education Credits: 3

Electives

Choose 9 credits from the following:

- EDSE 626 - The Inclusive Classroom Credits: 3
- EDSE 701 - Legal Issues and Special Populations Credits: 3
- EDSE 702 - Managing Resources for Special Education Programs Credits: 3
- EDSE 703 - Creating a Collaborative Culture Credits: 3

Total: 15 credits

Students with Disabilities who Access the Adapted Curriculum Graduate Certificate

Banner Code E1-CERG-SDAC

This 36-credit hour certificate offers required course work for Virginia teacher licensure in Special Education: Adapted Curriculum. Students who have completed graduate or undergraduate coursework prior to admission to this graduate certificate program may request that courses in this program be waived based on prior coursework. Students who are eligible to waive coursework must complete a minimum of 15 credits to graduate with the Students with Disabilities who Access the Adapted Curriculum Graduate Certificate.

The Students with Disabilities who Access the Adapted Curriculum Graduate Certificate program may be pursued on a part-time or full-time basis.

Certificate Requirements

- EDSE 501 - Introduction to Special Education Credits: 3
- EDSE 531 - Transition and Community-Based Instruction Credits: 3
- EDSE 532 - Positive Behavior Supports Credits: 3
  or
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3
- EDSE 533 - Curriculum and Assessment in Severe Disabilities Credits: 3
- EDSE 534 - Communication and Severe Disabilities Credits: 3
- EDSE 547 - Medical and Developmental Risk Factors for Children with Disabilities Credits: 3
- EDSE 557 - Foundations of Language and Literacy for Diverse Learners Credits: 3
- EDSE 661 - Curriculum and Methods: Severe Disabilities Credits: 3
- EDSE 662 - Consultation and Collaboration Credits: 3
- EDSE 669 - Interdisciplinary Approach for Children with Sensory and Motor Disabilities Credits: 3
- EDSE 790 - Internship in Special Education Credits: 1-6 (Must complete six credits of internship)

Total: 36 credits

Exit Requirement

Students enrolled in the Students with Disabilities who Access the Adapted Curriculum Graduate Certificate must demonstrate evidence of either: a) passing the Praxis II Elementary Education Content Knowledge Exam, or b) successful completion of an approved Praxis II Elementary Preparation course.

Students with Disabilities who Access the General Curriculum Graduate Certificate

Banner Code: E1-CERG-SDGC

This 33-credit certificate offers required course work for Virginia teacher licensure to individuals who will be working with students with disabilities who access the general curriculum. The program prepares individuals to work with students with disabilities who take Standards of Learning tests (SOLs) or Virginia Grade Level Assessments (VGLA). Students who have completed graduate or undergraduate coursework in a university program prior to admission to the certificate may request that courses in the certificate program be waived based on the content in prior coursework. Students waiving coursework must complete a minimum of 15 credits to be eligible for the certificate.

The graduate certificate in Students with Disabilities who Access the General Curriculum may be pursued on a part-time or full-time basis.

Certificate Requirements

- EDSE 501 - Introduction to Special Education Credits: 3
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3
- EDSE 503 - Language Development and Reading Credits: 3
- EDSE 540 - Characteristics of Students with Disabilities who Access the General Curriculum Credits: 3
- EDSE 544 - Adapted Instructional Methods and Transition for Secondary Learners Credits: 3
- EDSE 627 - Assessment Credits: 3
- EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum Credits: 3
- EDSE 629 - Secondary Curriculum and Strategies for Students with Disabilities who Access the General Curriculum Credits: 3
- EDSE 662 - Consultation and Collaboration Credits: 3
- EDSE 790 - Internship in Special Education Credits: 1-6 (Must complete two 3-credit internships: one elementary placement and one secondary placement)

Total: 33 credits
Teaching Students with Autism Graduate Certificate

Banner Code: E1-CERG-ETSA

This 15-credit non-licensure certificate provides teacher training in topic areas required to implement instructional programs for students with autism. This certificate is appropriate for those special education teachers providing instruction to students with autism in a variety of educational settings.

The graduate certificate in Teaching Students with Autism may be pursued on a part-time basis only.

Certificate Requirements

- EDSE 534 - Communication and Severe Disabilities Credits: 3
- EDSE 620 - Managing Severely Challenging Behaviors and Applied Behavior Analysis Credits: 3
- EDSE 634 - Characteristics of Students with Autism Credits: 3
- EDSE 635 - Interventions for Students with Autism Credits: 3
- EDSE 665 - Families of Children with Special Needs Credits: 3

Total: 15 credits

TFA - Special Education (Teach for America) Graduate Certificate

Banner Code: E1-CERG-TSED

This 31-credit certificate is designed to prepare Teach for America Corp Members to teach culturally, linguistically, and ability diverse special education students. Entry into program is restricted to Teach for America corps members.

The graduate certificate in TFA - Special Education (Teach for America) may only be pursued on a full-time basis.

Certificate Requirements

- EDSE 501 - Introduction to Special Education Credits: 3
- EDSE 502 - Classroom Management and Applied Behavior Analysis Credits: 3
- EDSE 503 - Language Development and Reading Credits: 3
- EDSE 540 - Characteristics of Students with Disabilities who Access the General Curriculum Credits: 3
- EDSE 544 - Adapted Instructional Methods and Transition for Secondary Learners Credits: 3
- EDSE 627 - Assessment Credits: 3
- EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum Credits: 3
- EDSE 629 - Secondary Curriculum and Strategies for Students with Disabilities who Access the General Curriculum Credits: 3
- EDSE 662 - Consultation and Collaboration Credits: 3
- EDSE 790 - Internship in Special Education Credits: 1-6 (Must register for 2 credits)
- EDSE 791 - Midpoint Portfolio Credits: 1
- EDSE 792 - Final Portfolio Credits: 1

Total: 31 credits

Visual Impairments Licensure, PK-12 Graduate Certificate

Banner Code: E1-CERG-VILI

This 32-credit certificate is designed for students seeking Virginia initial teacher licensure in visual impairments (PK–12). Students must complete EDSE 501 either prior to admission to the certificate or can take it in their first semester. Students who have completed graduate or undergraduate coursework in a university program prior to admission to the certificate may request that courses in the certificate program be waived based on the content in prior coursework. Students waiving coursework must complete a minimum of 15 credits to be eligible for the certificate.

The graduate certificate in Visual Impairments Licensure, PK-12 may be pursued on a part-time or full-time basis.

Certificate Requirements

- EDSE 511 - Characteristics of Students with Visual Impairments Credits: 1
- EDSE 512 - Braille Code Credits: 3
- EDSE 513 - Medical and Educational Implications of Visual Impairments Credits: 3
- EDSE 514 - Orientation and Mobility for Students with Visual Impairments Credits: 2
- EDSE 518 - Curriculum and Assessment of Students with Visual Impairments Credits: 3
- EDSE 522 - Assistive Technology for Individuals with Sensory Impairments Credits: 2-3 (Must register for 2 credits)
- EDSE 532 - Positive Behavior Supports Credits: 3
- EDSE 613 - Teaching Methods for Students with Visual Impairments Credits: 3
- EDSE 616 - Braille Reading and Writing Credits: 3
- EDSE 662 - Consultation and Collaboration Credits: 3
- EDSE 790 - Internship in Special Education Credits: 1-6 (Must complete six credits of internship)

Total: 32 credits

Doctoral Degree
Education, PhD

Banner Code: E1-PHD-EDUC

This 75-credit PhD in Education program is designed to advance professional study to develop leadership in a selected field of professional education. As a program of doctoral study, it emphasizes theory and research as much as it does practice, breadth of study as much as depth, and process as well as knowledge. It seeks to develop both knowledge and the skills useful in educational roles as well as the abilities to analyze and respond to problems in their relationships to various educational concerns. Students must satisfy all requirements for doctoral degree expressed in the Academic Policies section of this catalog.

Admissions Requirements

Candidates are admitted to study by the College of Education and Human Development (CEHD); admission is highly selective. Applicants must fulfill the following admission requirements:

- A minimum of three years of successful experience as a practitioner in an educational setting
- Baccalaureate and master's (or equivalent) degrees from accredited institutions
- Demonstrate high intellectual capability
- Demonstrate leadership potential
- Three letters of recommendations
- GRE general test scores including the writing assessment

For more information, call the PhD in Education Office at 703-993-2011. Completed applications must be submitted to the CEHD Graduate Admissions Office by February 1 for summer for fall admission, or by September 1 for spring admission.

Degree Requirements

Education doctoral candidates complete a minimum of 75 credits. PhD students are required to complete three portfolios at different stages in their program. Each student must demonstrate competence in oral and written English, mastery of knowledge and skills in the area of professional expertise, and the ability to apply general and specific knowledge and skills to significant educational problems.

Reduction of Credit (9 credits)

Students must have a master's degree before being admitted to the PhD in education. As such, admitted students will receive a reduction of 9 credits bringing the minimum coursework requirement total (including dissertation proposal and research) to 66 credits.

Core Requirements (30 credits)

All students pursuing the PhD in education take the following core courses, and dissertation:

General Culture (3 credits)

- EDUC 800 - Ways of Knowing Credits: 3
Research Methods (15 credits)

- EDRS 810 - Problems and Methods in Education Research Credits: 3
- EDRS 811 - Quantitative Methods in Educational Research Credits: 3
- EDRS 812 - Qualitative Methods in Educational Research Credits: 3

Select two additional courses from the following:
- EDRS 820 - Evaluation Methods for Educational Programs and Curricula Credits: 3
- EDRS 821 - Advanced Applications of Quantitative Methods Credits: 3
- EDRS 822 - Advanced Applications of Qualitative Methods Credits: 3
- EDRS 823 - Advanced Research Methods in Single Subject/Case Design Credits: 3
- EDRS 825 - Advanced Research Methods in Self-Study Credits: 3

Dissertation Proposal and Research (12 credits)

Once enrolled in EDUC 998, students must maintain continuous registration for at least 1 credit; once enrolled in EDUC 999, students must follow the university continuous registration policy as specified in the Academic Policies section of this catalog.

- EDUC 998 - Doctoral Dissertation Proposal Credits: 1-6 (Must register for 3 credits the first semester enrolled in EDUC 998. Students preparing their proposal must register for 1 credit each semester thereafter until the proposal has been successfully defended)
- EDUC 999 - Doctoral Dissertation Research Credits: 1-9 (Must register for 3 or 6 credits the first semester enrolled in EDUC 999. Must register for at least 1 credit thereafter until all work has been completed including the semester in which degree is received)

PhD without Concentration (36 credits)

Students who do not wish to pursue a concentration in education leadership, a concentration in learning technology design research (LTDR), or a concentration in science education research, must complete the following requirements:

Professional Specialization (24 credits)

Students select course work (including three internship credits) based on their area of specialization. Professional specializations include: counseling and development, early childhood education, education leadership, educational psychology, higher education, international education, literacy and reading, mathematics or science education leadership, multilingual/multicultural education, research methodology, special education, and teaching and teacher education.

Note: Students can choose to enroll in an optional internship designed to broaden their professional expertise. This internship must be taken in a setting that differs from the student’s work setting, and includes 100 clock hours of work.

Complementary Emphasis (12 credits)

Students may develop an emphasis from course work offered within CEHD or course work offered within other Mason units, in consultation with their advisor.
Note: In some situations, students can receive a reduction of 9 additional credits from their master's toward fulfillment of the emphasis requirement if their master's degree area of study is not the same as their doctoral specialization area and it aligns with their program of study. Students make this decision in consultation with their program advisory committee members.

Core and Coursework Total: 66 credits

▲ Concentration in Education Leadership (EDLE) (36 credits)

The PhD concentration in Education Leadership provides comprehensive course work to prepare candidates for research focused on important issues in education leadership. Candidates will become familiar with a wide variety of theory bases and they will study empirical research in areas as diverse as historical, political, and sociological trends in education; the economics of education; and instructional leadership. The concentration is designed to provide a scaffold from which candidates can develop the skills and perspectives required to conduct independent research in the area of education leadership. Candidates are required to develop their own research interests and questions as they move through the concentration so that they will be very well prepared to write their doctoral dissertation proposal, conduct dissertation research, and write their doctoral dissertations.

In addition to the doctoral program core requirements shown above, students must complete the following curriculum to earn the concentration:

Concentration Required Courses (36 credits)

- EDLE 770 - Introduction to Education Leadership Credits: 3
- EDLE 801 - Contemporary Organization Theory Credits: 3
- EDLE 802 - Leadership and Decision Making Credits: 3
- EDLE 803 - Foundations of Education Leadership: Economics and Leadership Credits: 3
- EDLE 813 - Social and Political Forces in Education Leadership Credits: 3
- EDLE 815 - Conceptual Frameworks in Education Leadership Credits: 3
- EDLE 816 - Instructional Leadership-Curriculum Policy and Practice Credits: 3
- EDLE 818 - Instructional Leadership-Supervision Policy and Practice Credits: 3
- EDLE 895 - Emerging Issues in Administration and Supervision Credits: 3
- EDUC 870 - Education Policy: Process, Context, and Politics Credits: 3
- EDUC 994 - Advanced Internship in Education Credits: 3
- Elective research course (approved by advisor) Credits: 3

Note: This can be in the form of an independent study course (preferred) or in addition to the 12 proposal and dissertation research credits required by the university.

Core and Coursework Total: 66 credits

▲ Concentration in Learning Technologies Design Research (LTDR) (36 credits)

The PhD concentration in Learning Technologies Design Research supports the in depth study of design-based research methods to address cross disciplinary design, development, and research in such areas as innovation and creativity in the design of
learning technologies, design and assessment of K-12 technology solutions and technology teacher education, technology solutions to support those with disabilities, and emerging technologies and practices. This doctoral concentration engages doctoral students in real world, integrated design and research. Doctoral candidates complete a sequence of core courses as well as choosing from one of three specialization areas: instructional systems design, integration of technology in schools, or assistive technology.

In addition to the doctoral program core requirements shown above, students must complete the following curriculum to earn the concentration:

Concentration Required Courses (24 credits)

- EDIT 801 - Nature and Process of Design Credits: 3
- EDIT 802 - Cognition and Technology: A Multidisciplinary Approach Credits: 3
- EDIT 803 - Design-Based Research Credits: 3
- EDIT 891 - Design Research Practicum Credits: 1-9 (must register for 9 credits)
- EDIT 895 - Emerging Issues in Instructional Technology Credits: 3
- Elective course (approved by advisor) Credits: 3

Concentration Emphasis (12 credits)

Students must complete 12 credits of coursework to satisfy this requirement, including courses stipulated in the three emphases areas below. Additional courses must be chosen in consultation with an advisor.

Note: In some situations, students can receive a reduction of up to 12 additional credits from their master's degree toward fulfillment of this requirement if their master's degree area of study is the same as their concentration emphasis. Students make this decision in consultation with their program advisory committee members.

Assistive Technology Emphasis

- EDCI 705 - Instructional Design Credits: 3
- EDIT 526 - Web Accessibility and Design Credits: 3
- EDSE 610 - Designing Adaptive Environments Credits: 2
- EDSE 649 - Advanced Clinical Psycho-Educational Assessment in Special Education Credits: 3
- Elective course (approved by advisor) Credits: 1

Instructional Systems Design Emphasis

- EDIT 705 - Instructional Design Credits: 3
- EDIT 730 - Advanced Instructional Design Credits: 3
- EDIT 732 - Analysis and Design of Technology-Based Learning Environments Credits: 3
- EDIT 752 - Design and Implementation of Technology-based Learning Environments Credits: 3
Integration of Technology in Schools Emphasis

- EDCI 710 - Technology and the Culture of Schools Credits: 3
- EDCI 712 - Technology and Learning Credits: 3
- EDCI 714 - Methods of Integration Credits: 3
- EDCI 716 - Principles of Technology Leadership Credits: 3

Core and Coursework Total: 66 credits

▲Concentration in Science Education Research (SCER) (36 credits)

The PhD concentration in Science Education Research supports the in-depth study of students interested in research in science education. Such a comprehensive and systematic concentration designed around doctoral level courses supports the science education program’s ability to offer a more robust and rigorous courses of study at the doctoral level. The major thrust of the science education research concentration is to prepare students for 21st century classrooms, to be collaborative, to produce and enhance critical thinking skills, and to embrace and foster creativity.

In addition to the doctoral program core requirements shown above, students must complete the following curriculum to earn the concentration:

Concentration Required Courses (18 credits)

- EDCI 810 - Foundations of Science Education Research Credits: 3
- EDCI 811 - Current Trends in Science Education Research Credits: 3
- EDCI 813 - Focused Science Education Research Credits: 3
- EDRS 827 - Development and Validation of Assessment Scales Credits: 3
- EDUC 994 - Advanced Internship in Education Credits: 3
- Cognition/Psychology elective course (approved by advisor) Credits: 3

Note:

Students must complete 12 credits of graduate level science courses coursework. Students must also select one specialization area to complete the program. The committee and the committee chairman must agree on both the 12 credits of graduate level science and the specialization courses.

Concentration Specializations (18 credits)

Science Teacher Education Specialization
The Science Teacher Education specialization of the science education research concentration provides the knowledge and skills to craft effective research on science education in K-12 settings and teacher preparation programs. Graduates of this pillar are prepared to assume positions at research focused universities and/or government agencies.

- Specialization coursework selected with advisor approval  Credits: 12
- Cognition/Psychology coursework selected with advisor approval  Credits: 6

**Non-Formal Science Education Specialization**

Non-Formal Science Education Specialization of the science education research concentration provides the knowledge and skills to craft effective research on science education in non-formal settings such as museums, science centers, zoos and aquariums. Graduates of this pillar are prepared to assume positions at research focused at the aforementioned non-formal settings.

- Specialization coursework selected with advisor approval  Credits: 12
- Cognition/Psychology course selected with advisor approval  Credits: 3
- Advanced science teaching methods course selected with advisor approval  Credits: 3

**University Science Education Specialization**

The University Science Education Specialization of science education research concentration provides the knowledge and skills to craft effective research on science education in science content departments at the university level. Graduates of this pillar are prepared to assume positions at research focused universities and/or government agencies where a thrust on pedagogical research in the science at the undergraduate and graduate levels.

- Specialization coursework selected with advisor approval  Credits: 12
- Cognition/Psychology course selected with advisor approval  Credits: 3
- Advanced science teaching methods course selected with advisor approval  Credits: 3

**Core and Coursework Total: 66 credits**

**Total: 75 credits**
College of Health and Human Services

Phone: 703-993-1901  
Web: chhs.gmu.edu  
College Code: HH

Academic Departments

- Global and Community Health
- Health Administration and Policy
- Nutrition and Food Studies
- Rehabilitation Science
- School of Nursing
- Social Work

The College of Health and Human Services (CHHS) comprises the School of Nursing, the Department of Global and Community Health (GCH), the Department of Health Administration and Policy (HAP), the Department of Nutrition and Food Studies (NUTR), the Department of Rehabilitation Science (RHBS), and the Department of Social Work (SOCW). The college prepares students to provide professional leadership, care, and services related to health promotion, wellness, disease prevention, and quality of life through the advancement of physical, social, and environmental health practices.

Since 1974, with the approval of its first baccalaureate nursing program, CHHS has evolved and expanded in response to the ever-changing fields of health care and social work. The college is multidisciplinary and offers degree programs and research opportunities in health administration, health policy, health information systems, health services research, nursing, public health, nutrition, global health, rehabilitation science, gerontology, and social work.

CHHS offers regular information sessions to prospective students. For dates and times, or to register for a session, visit the information sessions website or call the CHHS Office of Student Affairs at 703-993-1901.

Administration

Shirley Travis, Dean  
Jack Hadley, Associate Dean, Finance and Planning  
Keith Howell, Associate Dean, Research and Program Evaluation  
Robin Remsburg, Associate Dean and Director, School of Nursing  
Frank J. Whittington, Senior Associate Dean, Academic Affairs  
Jan Boyd, Assistant Dean, Academic Outreach  
Susan J. Swett, Assistant Dean, Student Affairs  
Andrew Guccione, Chair, Rehabilitation Science  
Cathleen Lewandowski, Chair, Social Work  
P. J. Maddox, Chair, Health Administration and Policy  
Lisa Pawloski, Chair, Nutrition and Food Studies  
Rick Zimmerman, Chair, Global and Community Health

Faculty
Faculty emeriti: Ailinger, Boland, Boyd, Brenkus, Carty, Jenkins, Langley, Normile, Parker-Smith, Redmond, Silva, Sorrell, Walker, Wu

Professors: Gaffney, Gerber, Guccione, Hadley, Howell, Kluger, Lewandowski, Maddox, Meiners, Metcalf, Milligan, Nichols, Raskin, Remsburg, Richards, Ritchie, Rose, Sluzki, Travis, Whittington, Vail, Zimmerman


Assistant professors: Campo, Carle, Cantiello, Clark, Cleaveland, Dawson, Dickman, Evans, Freeborne, Frankenfield, Gewa, Gill, Ihara, Kirsch, Kodadek, Maradiegue, Miklancie, Min, Moss, Nambisan, Oh, Peppard, Rosenberger, Slavin, Smoczynski, Urban, Weinstein, Willis, Wojtusiak, Yang, Zhou

Instructors: Almond, Burke, Cox, Davis, Durham, Henderson, Middle, Shiver, Stoehr, Toulouse, Winter

Research Instructor: Debold

Course Work

CHHS offers all course work designated GCH, HAP, HHS, NURS, NUTR, RHBS, and SOCW in the Courses chapter of this catalog.

Academic Programs

CHHS is committed to educating the next generation of health professionals, researchers, and educators. Our School of Nursing produces more new RNs each year than any other program in Virginia, and these graduates have one of the state’s highest pass rates on the nursing licensure exam. Through the PhD program in nursing, the college is helping to fill the need for nursing faculty and researchers, and through the DNP program, provides an opportunity for nurses to become experts as nurse practitioners, nurse administrators, or clinical nurse specialists. The Department of Health Administration and Policy prepares students for careers as leaders of health care organizations and as health policymakers at the state and national levels, while the Department of Global and Community Health trains public health practitioners with a global reach, who can intervene and improve the health of local and international populations. The Department of Rehabilitation Science provides interdisciplinary programs to educate students to address the needs of the disabled. Graduates of the PhD program in rehabilitation science are prepared for careers in academic, governmental, and industrial research environments. The Department of Nutrition and Food Studies integrates education, research, and outreach in preparing students to improve the health and well-being of populations through food and nutrition. The Department of Social Work educates undergraduate and graduate students to be professional social workers practicing in either community organizations or clinical settings. The CHHS academic units offer a variety of specializations within degree programs, including gerontology, epidemiology and biostatistics, forensic nursing, health technology and informatics, data security, clinical social work, and conflict analysis and resolution.

Professional Conduct Policy

All CHHS students are expected to conduct themselves professionally at all times. This means that certain behavior is prohibited, including verbal abuse, insubordination, and behavior that threatens the safety of a client, another student, a faculty member, or other health care provider when the behavior occurs within the context of an academic program. CHHS reserves the right to place on probation, suspend, or dismiss any student in its programs who engages in such conduct. Students disciplined for such reasons have the right to appeal to their department chair or director.

Student Affairs
The Office of Student Affairs supports students, faculty, and staff members on a variety of admissions, academic, and policy issues. Student Affairs is involved in recruiting new students; pre-admissions advising; processing applications for graduate programs and undergraduate nursing programs; and conducting orientations for newly admitted students.

Student Affairs maintains the college’s student records; reviews and recommends action on student requests for exceptions to academic policy; processes standard academic actions; and approves student records for degree completion prior to graduation. Student grade appeals fall under university policy as described in the Academic Policies section of the catalog.

Each CHHS student is assigned an academic advisor, with whom he or she should meet at least once per semester in order to ensure that program requirements are met. The assigned advisor may be a faculty member, a departmental program coordinators, or an advisor in the Office of Student Affairs.

**Student Responsibility**

All students are required to have an active Mason e-mail account and to update any change of address on-line through Patriot Web. The college will not communicate with students via a personal e-mail address, so it is important that students check their Mason e-mail regularly. Students are responsible for knowing the university academic policies and the policies governing their program as stated in the university catalog. They are also responsible to know the semester academic calendar including withdrawal deadlines; to review their Mason transcript on-line to ensure transfer of credit accuracy; and to monitor their degree progression through the degree evaluation tool on Patriot Web.

**Background Checks**

Many clinical agencies and practicum sites mandate that students working there have a criminal background check. All students enrolled in the School of Nursing are required to complete a criminal background check prior to beginning the program. Students enrolled in other CHHS programs may be required to complete background checks before entering a practicum environment. Information obtained from the background check is strictly confidential but may result in a student’s inability to perform clinical or practicum activities and, therefore, will disqualify the student from entering or continuing in the program. School of Nursing students are sent information regarding the criminal background check process, and associated fees, in their admission packets. Other students are informed individually as they are considered for practicum activities requiring background checks. Students are responsible for notifying the assistant dean of student affairs of any arrests, regardless of adjudication, that occur after acceptance and during enrollment in the program. Failure to promptly notify the assistant dean of student affairs may be grounds for dismissal from the program.

**Health Records**

To comply with the policies established by the Commonwealth of Virginia, all students must provide current immunization records to the university’s Student Health Services at the time of admission to the college. Immunizations may be obtained through Student Health Services on any of the Mason campuses. All students in the School of Nursing also must submit immunization records to the School of Nursing at the time of admission. Additional documentation of good health may be required.

Students should keep copies of their health records should agencies require them for clinical and practicum assignments. All costs associated with immunizations and certifications are the student’s responsibility.

**Insurance and Liability**

Students are strongly advised to maintain health insurance coverage at all times. All students enrolled in the School of Nursing are required to maintain health insurance at all times. A student health insurance plan is available to eligible students through Mason. Students are responsible for their own health care, including emergency care, and CHHS assumes no financial responsibility for the health care of students. Enrolled students who are performing internships and similar experiential learning
as a required part of their academic programs are considered agents of the university. They are covered for professional liability by the Commonwealth of Virginia Risk Management Plan while engaged in their prescribed educational duties.

**Academic Outreach**

The mission of the Office of Academic Outreach is to provide off-campus graduate coursework that supports the continued professional development and competency of practicing health professionals. This purpose is accomplished through collaborative relationships with expert health and instructional resources—individual and organizational—both internal and external to the University.

**Academic Policies**

Students should become familiar with the university's general academic policies in addition to those specific to each academic unit. Please see the Academic Policies section of this catalog.

■ **School of Nursing**

Phone: 703-993-1901 (Undergraduate programs)
Phone: 703-993-1947 (Master's programs)
Phone: 703-993-1961 (Doctoral program)
Web: nursing.gmu.edu

**Faculty**

**Emeriti:** Ailinger, Boland, Boyd, Brenkus, Carty, Jenkins, Langley, Normile, Paker-Smith, Redmond, Silva, Sorrell, Walker, Wu

**Professors:** Gaffney, Milligan, Remsburg (associate dean/director), Richards (assistant dean, doctoral division), Travis (dean), Vail

**Associate Professors:** Chong, Davidson, Douglas, Hatcher, Mahon, McDaniel, Rodan (assistant dean, masters/post masters division)

**Assistant Professors:** Campo, Dickman, Evans, Gill, Kodadek, Maradiegue, Miklancie, Moss, Oh, Peppard, Smoczynski, Urban (assistant dean, undergraduate division), Willis, Zhou

**Instructors:** Almond, Burke, Cox, Davis, Durham, Middle, Stoehr, Toulouse

The School of Nursing is a teaching/learning organization with a national and international academic reputation, grounded in sound general education. It develops and supports a diverse faculty who are visionary and competent practitioners, scholars, and researchers, excellent in teaching in academic and practice settings, and responsive to the needs of students and the community. Specifically, the Nursing programs prepare graduates to function as providers, coordinators, and managers of care and for leadership, advanced practice, and nurse scholar roles, as well as members of the nursing profession. Graduates of the School of Nursing are prepared to function as interdisciplinary health professionals and citizens who provide leadership, care, and service to the community. The School promotes health and well being through its programs and centers, engaging in scholarly activities and research with the aim of maximum health for all people. Part-time students are encouraged to take at least 6 credits per semester to promote timely completion of the program.

**Undergraduate Degree**
Nursing, BSN

Banner Code: HH-BSN-NURS

Unit: School of Nursing

The Bachelor of Science in Nursing (BSN) Program is accredited by the Virginia State Board of Nursing and the Commission on Collegiate Nursing Education. The undergraduate nursing program prepares students to deliver superior nursing care and provide leadership in nursing in the increasingly complex and challenging field of modern health care. Graduates are in demand as professional nurses in hospitals, long-term care facilities, and community health and other health care agencies. The program emphasizes health promotion and disease prevention, capitalizing on early detection of potential health problems, health maintenance in ambulatory and acute-care agencies, and preparation for the managerial responsibilities of nursing.

The School of Nursing offers three pathways to complete the BSN, all of which lead to completion of the objectives of the undergraduate program. The traditional pathway is a two-year curriculum following the completion of general education and prerequisite requirements. An accelerated RN-to-BSN pathway for students holding current registered nurse (RN) licenses may be completed in one year (full-time) following completion of general education and prerequisite requirements. The accelerated, second degree pathway is a 12-month curriculum for students holding a baccalaureate degree outside of nursing. The traditional and accelerated pathways in nursing must be completed on a full-time basis.

Admission Requirements

To be admitted to the BSN program, students must complete a prenursing curriculum during their first two years and be admitted to junior standing. Students admitted in the traditional and accelerated, second degree pathways will enter the program in the fall of their junior year and at that point are considered nursing majors. Students admitted to the RN-to-BSN pathway may enter in the fall or spring semester.

Application to the BSN program is a process involving two applications: the George Mason University Undergraduate Application and the BSN Departmental Application. (Currently enrolled Mason students need only apply using the BSN Departmental Application.) Acceptance to the nursing program is contingent upon admission to the university, but admission to the university does not guarantee admission to the nursing program. Application to the BSN major is a competitive admission process. Prospective applicants are responsible to meet all BSN admission requirements at the time of application. Meeting the minimum requirements does not guarantee admission into the nursing program—it only allows an application to be considered. Students who are interested in pursuing a major in nursing are strongly encouraged to attend an information session provided by the CHHS Office of Student Affairs for advising prior to applying to the nursing major.

Attendance at the first meeting of all nursing courses (lectures, on-campus laboratories, and agency laboratories) is mandatory.

Writing Intensive Requirement

Mason requires all students to complete at least one 300- or 400-level "writing intensive" course as designated by their department. Students majoring in nursing fulfill this requirement by successfully completing NURS 465.

Academic Grade Standards

Acceptable grades in the School of Nursing are grades of C or better, or an S grade. After admission to junior-year standing and to the nursing program, a student who earns a grade lower than a C in one required nursing course (NURS or HHS prefix) must repeat the course and earn a grade of C or higher to continue progression in nursing coursework. This will alter or halt further progression in the nursing program and affect the expected graduation date. A student may repeat only one nursing course, one time. A student who fails to earn a C or higher in the repeated course is terminated from the BSN program. In addition, earning a
grade lower than a C in a second nursing course results in termination from the nursing program. Termination from any one of the nursing undergraduate pathways constitutes termination from the undergraduate (BSN) nursing major in the School of Nursing.

Because of the sequential nature of the nursing curriculum, students are not allowed to progress to the next semester of nursing coursework while a grade of “IN” (incomplete) remains on their academic record. A passing grade of C or higher must be recorded before beginning the next semester’s courses.

**Professional Conduct Policy**

All students in the School of Nursing are expected to adhere to the Professional Conduct Policy of the College of Health and Human Services.

**Appeal Process**

Although faculty members in the nursing program are generally the best judges of a student’s professional performance, there may be times when a student believes a grade is unfair. Students in the School of Nursing wishing to appeal a grade are expected to follow the GMU guidelines for grade appeals, found in the Academic Policies section of the GMU University Catalog.

**NCLEX Readiness Preparation and Testing**

Throughout the BSN program, all students, with the exception of RN-to-BSN students, participate in preparation for the NCLEX-RN licensing exam through opportunities provided during nursing courses. These opportunities are included as integrated components of select courses and include practice NCLEX-style exams and content-specific testing. A final cumulative assessment exam is given toward the end of the program to provide the student with guidance about their chance for success on the licensing exam. A final course in critical thinking and test-taking strategies is required in the senior year, and remediation in select content areas may be required as a component of this course.

**Special Requirements**

Fees and expenses related to the nursing program include: skills laboratory fee, standardized testing and course materials, uniforms, stethoscope, name pin, books, CPR certification, health forms, health insurance, immunizations, and criminal background check fees. The availability of personal transportation to and from clinical agencies is required of all students. For a summary of all current fees and estimated expenses, see the School of Nursing web site.

All BSN students are required to obtain a health clearance and complete the immunizations required by GMU as listed in the Student Health Services section of the GMU catalog. In addition, the BSN program has additional health and immunization requirements to meet the requirements of its clinical agency partners. See the Undergraduate Program, School of Nursing website for the most current information. Students are not allowed into any clinical setting without the completed immunization series as prescribed by GMU or the School of Nursing and may have an offer of admission withdrawn for inability to meet these requirements. The School of Nursing reviews health records and reserves the right to refuse admission or continued enrollment to any student who is unable to comply with these requirements.

All students must have CPR certification before entering the first clinical nursing course and maintain it through the remainder of the program. The American Heart Association Basic Life Support - Health Care Provider is required. On-line renewal of CPR certification is not accepted. Any cost incurred is the responsibility of the student.

All students must have current health insurance before entering the first clinical nursing course and maintain it through the remainder of the program. All students are required to have an active Mason e-mail account.
No student or faculty member will be discriminated against or denied admission to the nursing program for the sole reason that the student or faculty member has been exposed to, infected with, or diagnosed with HIV or HBV. All students are expected to practice Universal Precautions with all clients, and failure to do so will result in termination from the nursing major. In the event that a student has a clinical experience or practicum exposure to body fluids of a client, procedures and appropriate reports are completed according to institutional and nursing policies. Information related to exposure or infection is confidential, and dissemination of such information is based on the need-to-know criteria that apply in health care situations. HIPAA and FERPA regulations apply. A complete and detailed HIV/HBV policy is available in the CHHS Office of Student Affairs.

**RN Requirements**

RN-licensed students enrolled in the RN-to-BSN pathway are required to submit a copy of their current license prior to the first day of class. RN-licensed students must maintain current licensure throughout the academic program.

**Degree Requirements**

**General Education (30 credits)**

**Written Communication:**

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3

*Note: Non-native speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.*

**Oral Communication:**

Choose one of the following:

- COMM 100 - Public Speaking Credits: 3
- COMM 101 - Interpersonal and Group Interaction Credits: 3

**Information Technology:**

Choose one of the following:

- IT 103 - Introduction to Computing Credits: 3
- CDS 130 - Computing for Scientists Credits: 3

**Literature:**

- An approved University General Education literature course.

**Arts:**
• An approved University General Education arts course.

Western Civilization:

Choose one of the following:

• HIST 100 - History of Western Civilization Credits: 3
• HIST 125 - Introduction to World History Credits: 3

Global Understanding:

• An approved University General Education global understanding course.
  The recommended course is:
• GCH 205 - International Health Credits: 3

Social Science:

• PSYC 100 - Basic Concepts in Psychology Credits: 3
  Choose one of the following:
• SOCI 101 - Introductory Sociology Credits: 3
• ANTH 114 - Introduction to Cultural Anthropology Credits: 3

Designated Nursing Prerequisites (24 credits)

  Anatomy and physiology:
• BIOL 124 - Human Anatomy and Physiology Credits: 4
• BIOL 125 - Human Anatomy and Physiology Credits: 4
  BIOL 124 and 125 meet the natural science general education requirement.
  Microbiology:
• BIOL 246 - Introductory Microbiology Credits: 3
• BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
  Bioethics:
• PHIL 309 - Bioethics Credits: 3
  Statistics:
• STAT 250 - Introductory Statistics I Credits: 3
  Statistics 250 fulfills the quantitative reasoning general education requirement.
  Human Lifespan Development:
• PSYC 211 - Developmental Psychology Credits: 3
  Nutrition:
• NUTR 295 - Nutrition for Health Professionals Credits: 3

Electives (4 credits)

Students will complete 4 credits of electives.
Traditional BSN Pathway (62 credits)

To be eligible to apply for the traditional BSN program, applicants must have achieved a minimum GPA of 3.00 in the designated nursing prerequisite coursework and must have earned a C or better in each of the following courses: anatomy and physiology (BIOL 124 and 125, 8 credits); microbiology (BIOL 246 and 306, 4 credits); statistics (STAT 250, 3 credits); nutrition (NUTR 295, 3 credits); developmental psychology (PSYC 211, 3 credits); and bioethics (PHIL 309, 3 credits). Applicants must have completed two of the three science prerequisite courses (anatomy and physiology I, anatomy and physiology II, and microbiology) by the submission date of the BSN application. Coursework in anatomy and physiology and microbiology cannot be more than five years old by the time of BSN enrollment. Additional eligibility requirements include a grade of C or better in all general education courses and electives.

Application to the BSN program is a process involving two applications: the George Mason University Undergraduate Application and the BSN Departmental Application. (Currently enrolled Mason students need only apply using the BSN Departmental Application.) Admission to the university does not guarantee admission to the nursing program. Acceptance to the nursing program is contingent upon admission to the university. See the CHHS undergraduate admissions website for the latest information on applications and deadlines.

Application to the BSN major is a competitive admission process. Meeting the minimum requirements does not guarantee admission into the nursing program - it only allows an application to be considered in the review process.

The traditional BSN pathway is a full-time program beginning in the fall semester and is completed in two years (four semesters).

Traditional BSN Major, Required Courses (62 credits)

- NURS 312 - Basic Nursing Care of Adults Credits: 4
- NURS 330 - Nursing Fundamentals Credits: 3
- NURS 334 - Nursing as a Health Profession and Discipline Credits: 3
- NURS 337 - Applied Nursing Fundamentals and Health Assessment Credits: 1
- NURS 343 - Pharmacology Credits: 3
- NURS 344 - Intermediate Nursing Technologies Credits: 1
- NURS 347 - Adult Pathophysiology and Nursing Care Credits: 2
- NURS 348 - Maternal-Newborn Physiology, Pathophysiology, and Nursing Care Credits: 2
- NURS 349 - Pediatric Pathophysiology and Nursing Care Credits: 2
- NURS 358 - Health Promotion and Disease Prevention in Maternal/Infant Nursing Credits: 2
- NURS 359 - Health Promotion and Disease Prevention in Pediatric Nursing Credits: 2
- NURS 388 - Problem-Based Clinical Inquiry Credits: 3
- NURS 410 - Nursing Care of Clients with Pathological Conditions Credits: 3
- NURS 425 - Comprehensive Health Assessment Credits: 3
- NURS 436 - Leadership and Management of Health Care Credits: 3
- NURS 451 - Advanced Clinical Preceptorship Credits: 5
- NURS 453 - Research in Nursing Credits: 3
- NURS 455 - Advanced Technologies in Nursing Credits: 2
- NURS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3
- NURS 466 - Community Health Nursing Credits: 2
- NURS 467 - Clinical in Community Health Nursing Credits: 2
- NURS 468 - Psychiatric and Mental Health Nursing Credits: 2
- NURS 469 - Clinical in Psychiatric and Mental Health Nursing Credits: 2
- NURS 488 - Inquiry-Based Clinical Seminar Credits: 2
NURS 491 - Critical Thinking and Analysis of Test Taking Strategies Credits: 2

Total: 120 credits

Concentrations: Alternative Pathways

Students who are eligible for an alternative pathway to the BSN must meet the nursing course requirements for the pathway to which they have been admitted rather than those for the traditional BSN pathway described above.

Except where noted in the concentration description, requirements for general education (30 credits), designated nursing prerequisites (24 credits) and the elective for the major (4 credits) are still required.

▲ Accelerated, Second Degree BSN Pathway (SEC)

The Accelerated, Second Degree BSN Pathway is designed for applicants already holding a bachelor's degree who are interested in pursuing an undergraduate degree in nursing. This full-time accelerated program begins in the fall semester and is completed in 12 months.

Applicants must have a baccalaureate degree from an accredited college or university and must have earned a minimum cumulative GPA of 2.85 in their first degree. The non-nursing baccalaureate degree must be completed by the end of the spring semester of the year a student desires to be considered for fall admission.

Applicants to the second degree pathway must have achieved a minimum GPA of 3.00 in the designated nursing prerequisite course work and must have earned a C or better in each of the following courses: anatomy and physiology (BIOL 124 and 125, 8 credits); microbiology (BIOL 246 and 306, 4 credits); statistics (STAT 250, 3 credits); nutrition (NUTR 295, 3 credits); developmental psychology (PSYC 211, 3 credits); and bioethics (PHIL 309, 3 credits). Applicants must have completed two of the three science prerequisite courses (anatomy and physiology I, anatomy and physiology II, and microbiology) by the submission date of the BSN application. Coursework in anatomy and physiology and microbiology cannot be more than five years old by the time of BSN enrollment.

Application to the BSN program is a process involving two applications: the George Mason University Undergraduate Application and the BSN Departmental Application. (Currently enrolled Mason students need only apply using the BSN Departmental Application.) Admission to the university does not guarantee admission to the nursing program. Acceptance to the nursing program is contingent upon admission to the university. See the CHHS undergraduate admissions website for the latest information on applications and deadlines.

Application to the BSN major is a competitive admission process. Meeting the minimum requirements does not guarantee admission into the nursing program - it only allows an application to be considered in the review process.

Second Degree Pathway Requirements

Candidates for the degree must present at least 120 credits:

- General Education requirements: 49 credits are transferred from the first degree. Mason general education requirements are satisfied by the initial degree and fulfilled through transfer credit.
- Designated nursing prerequisites: 24 credits
- Concentration requirements: 47 credits. Specific requirements are as follows:
Second Degree Concentration, Required Courses (47 credits)

- NURS 305 - Application of Basic Nursing Techniques Credits: 1
- NURS 309 - Introduction to Basic Nursing Care Credits: 3
- NURS 310 - Application of Basic Nursing Care Credits: 3
- NURS 319 - Pathophysiological Basis for Nursing Care of Individuals and Small Groups Credits: 4
- NURS 334 - Nursing as a Health Profession and Discipline Credits: 3
- NURS 343 - Pharmacology Credits: 3
- NURS 350 - Application of Nursing Care for Individuals and Small Groups Credits: 5
- NURS 351 - Application of Intermediate Nursing Technologies Credits: 1
- NURS 419 - Pathophysiological Basis for Nursing Care of Individuals and Small Groups II Credits: 3
- NURS 425 - Comprehensive Health Assessment Credits: 3
- NURS 427 - Advanced Technologies for the Accelerated Pathway Credits: 1
- NURS 428 - Community Health Clinical for the Accelerated Pathway Credits: 2
- NURS 429 - Preceptorship for the Accelerated Pathway Credits: 3
- NURS 436 - Leadership and Management of Health Care Credits: 3
- NURS 440 - Community Health and Epidemiology Credits: 3
- NURS 453 - Research in Nursing Credits: 3
- NURS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3

Total: 120 credits

▲ Accelerated RN-to-BSN Pathway (RN)

The Accelerated RN-to-BSN Pathway allows RNs to progress quickly through the program through online coursework while meeting the objectives of the undergraduate curriculum. On completion of the general education requirements and designated nursing prerequisites, RN students can complete the BSN in two semesters of full-time study. The program can also be completed on a part-time basis.

RN students must satisfy all general education requirements and designated nursing prerequisites. RN-licensed students enrolled in the RN-to-BSN pathway are required to submit a copy of their current license prior to the first day of class. RN-licensed students must maintain current licensure throughout the academic program.

Application to the BSN program is a process involving two applications: the George Mason University Undergraduate Application and the BSN Departmental Application. (Currently enrolled Mason students need only apply using the BSN Departmental Application.) Admission to the university does not guarantee admission to the nursing program. Acceptance to the nursing program is contingent upon admission to the university. See the CHHS undergraduate admissions website for the latest information on applications and deadlines.

Application to the BSN major is a competitive admission process. Meeting the minimum requirements does not guarantee admission into the nursing program - it only allows an application to be considered in the review process.

RN-to-BSN Pathway Requirements

Candidates for the degree must present at least 120 credits. A minimum of 30 credits must be earned at Mason to fulfill requirements for graduation. These include:
• 21 credits of nursing prerequisite courses, described below;
• 24 credits specific to the concentration, described below;
• 12 credits of electives, described below;
• 33 credits designated “Credit by Exam,” described below.

30 credits of general education must be completed as previously described in the general degree requirements section. Transfer credits are accepted for many general education and prerequisite courses that may have been completed at other colleges or universities by students coming in with an RN. Students must take ENGH 302, listed above under general education requirements. Only students holding a previous baccalaureate degree are not required to take ENGH 302.

RN-to-BSN Pathway Prerequisites (21 credits)

• Psychology (3 credits)
  Anatomy and physiology:
  • BIOL 124 - Human Anatomy and Physiology Credits: 4
  • BIOL 125 - Human Anatomy and Physiology Credits: 4
  Microbiology:
  • BIOL 246 - Introductory Microbiology Credits: 3
  • BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
  Bioethics:
  • PHIL 309 - Bioethics Credits: 3
  Statistics:
  • STAT 250 - Introductory Statistics I Credits: 3

RN-to-BSN Pathway, Required Courses (24 credits)

• NURS 336 - Concepts in Professional Nursing as a Discipline Credits: 3
• NURS 425 - Comprehensive Health Assessment Credits: 3
• NURS 436 - Leadership and Management of Health Care Credits: 3
• NURS 440 - Community Health and Epidemiology Credits: 3
• NURS 434 - Vulnerable Populations Credits: 3
• NURS 453 - Research in Nursing Credits: 3
• NURS 457 - Introduction to Nursing Informatics Credits: 3
• NURS 465 - Examination and Integration of Professional and Health Care Issues Credits: 3

Electives (12 credits)

Credit by Exam (33 credits)

RN students will be awarded 30 nursing credits and 3 elective credits upon completion of NURS 336.

Total: 120 credits
Master's Degree

Nursing, MSN

Banner Code: HH-MSN-NURS

Unit: School of Nursing

The Master of Science in Nursing (MSN) program is accredited by the Virginia State Board of Nursing and the Commission on Collegiate Nursing Education. The program prepares nurses for a variety of leadership roles in the health care delivery system. The adult and family nurse practitioner primary care concentrations have been approved by the state boards of nursing and medicine in Virginia. The concentration in nursing administration prepares nurses to function in management positions in hospitals, nursing homes, community health agencies, and other health-related facilities. The nurse educator concentration prepares graduates for faculty positions in schools of nursing, as well as nurse educator positions in hospitals and community health care agencies.

Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog, and apply using the online Application for Graduate Admission. MSN applicants must hold an active state-based/US license as a registered nurse (RN), a current CPR card, and work experience as an RN. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

Transfer of Credit

Students may transfer a maximum of 9 credits into the MSN in Nursing program from graduate courses taken at other institutions or taken at Mason in nondegree status, including courses offered through the college’s Academic Outreach program. Transfer credit is subject to university and college policies and must be approved by the program director and the dean. Students who enroll initially through Nondegree Studies or the Academic Outreach program should seek course advising through the department and should submit their application to the MSN program in their first semester of study.

Special Requirements

Graduate students are required to have up-to-date annual health exams, current immunizations and CPR certification. Criminal background checks are required of all School of Nursing students. Student health exams, immunization records, and criminal background checks are part of the final admission process. No student may attend practicum courses unless all the requirements for CPR, health exams, immunizations, and criminal background checks are met. All students enrolled in the School of Nursing are required to maintain health insurance at all times. Students must be in the process of completing a hepatitis B immunization series when they enroll for their first practicum course. All students are required to have an active Mason e-mail account.

Professional Conduct

All students in the School of Nursing are expected to adhere to the Professional Conduct Policy of the College of Health and Human Services.
Appeal Process

Although faculty members in the nursing program are generally the best judges of a student's professional performance, some students may feel that the faculty member's judgment is unfair. Students in the School of Nursing wishing to appeal a grade are expected to follow the GMU guidelines for grade appeals, found in the Academic Policies section of the GMU University Catalog.

Honor System and Code

The School of Nursing supports academic integrity and follows the standards and procedures as described in the University catalog and available at academicintegrity.gmu.edu

Academic Termination and Dismissal

A degree-seeking nursing graduate student is terminated from the program after accumulating grades of F in two courses or 8 credits of unsatisfactory grades (C or below) in graduate courses. Academic dismissal is governed by university policy.

Degree Requirements

The master’s program in nursing requires 30 to 49 graduate credits. Of these, a 15-credit core consists of course work in the theoretical and ethical foundations of nursing, nursing research and biostatistics, nursing informatics, and the organization of nursing and health care delivery systems. The remaining credits are satisfied by completing one of the concentrations. The nursing administration concentration requires an additional 24 credits; the advanced clinical nursing concentration, an additional 27-30 credits; the nurse educator concentration, an additional 26 credits; the adult nurse practitioner concentration, an additional 28 credits; and the family nurse practitioner concentration, an additional 34 credits.

A graduate course in which a grade of C or below is earned may be repeated only once. Graduate students (both master’s and doctoral) may repeat no more than two courses in their total program of study. A failing grade of "F" in a practicum course may result in termination from the program. Up to 9 credits may be transferred into the MSN program from non-degree status or another university.

Actual clinical hours may exceed those listed in the catalog. Actual clinical hours will meet those required for certification purposes. Requirements in the catalog reflect the minimum number of credits.

MSN Level I Core Courses (required of all students): 15 credits

- NURS 665 - Theoretical and Ethical Foundations Related to Nursing Credits: 3
- NURS 715 - Nursing Informatics Inquiry Credits: 3
- NURS 757 - Nursing Research and Biostatistics I Credits: 3
- NURS 758 - Nursing Research and Biostatistics II Credits: 3
- NURS 688 - Organization of Nursing and Health Care Delivery Systems Credits: 3

Concentrations: Complete One

Students in the MSN will complete one concentration from the following:
▲ Adult Nurse Practitioner in Primary Care Concentration (ANPR)

Level II Courses Core (14 credits)

- NURS 643 - Community-Oriented Primary Care Credits: 3
- NURS 713 - Decision Making and Pharmacologic Management in Practice Credits: 2
- NURS 714 - Health Assessment in Clinical Practice Credits: 2
- NURS 724 - Health Assessment Practicum Credits: 1
- NURS 761 - Pharmacotherapeutics Credits: 3
- NURS 769 - Physiology and Pathophysiology in Advanced Practice Credits: 3

Required Courses (14 credits)

- NURS 770 - Adult Primary Care I Credits: 3
- NURS 772 - Adult Primary Care Practicum I Credits: 3
- NURS 771 - Adult Primary Care II Credits: 4
- NURS 774 - Adult Primary Care Practicum II Credits: 4

Total: 28 credits

▲ Advanced Clinical Nursing Concentration (NUAC)

Level II Courses Core (9 credits)

- NURS 714 - Health Assessment in Clinical Practice Credits: 2
- NURS 724 - Health Assessment Practicum Credits: 1
- NURS 761 - Pharmacotherapeutics Credits: 3
- NURS 769 - Physiology and Pathophysiology in Advanced Practice Credits: 3

Required Courses (12 credits)

- NURS 773 - Clinical Applications of Theory in Advanced Clinical Nursing Credits: 3
- NURS 775 - Advanced Specialty Practice I Credits: 3
• NURS 776 - Development of Advanced Practice Nursing Role Credits: 3
• NURS 778 - Advanced Specialty Practice II Credits: 3

Elective Courses (6 credits)

Cognates in area of expertise. Students may take NURS 740 for 3 elective credits.

Clinical Nurse Specialist Emphasis

Students in the advanced clinical nursing concentration who opt for the clinical nurse specialist emphasis must accrue 500 clinical hours by completing:

• NURS 740 - Clinical Nurse Specialist Internship Credits: 3
  May be repeated once if necessary to accrue 500 hours (for total of 6 credits)

Total: 27-30 credits

▲ Family Nurse Practitioner in Primary Care Concentration (FNUP)

Level II Courses Core (14 credits)

• NURS 643 - Community-Oriented Primary Care Credits: 3
• NURS 713 - Decision Making and Pharmacologic Management in Practice Credits: 2
• NURS 714 - Health Assessment in Clinical Practice Credits: 2
• NURS 724 - Health Assessment Practicum Credits: 1
• NURS 761 - Pharmacotherapeutics Credits: 3
• NURS 769 - Physiology and Pathophysiology in Advanced Practice Credits: 3

Required Courses (20 credits)

• NURS 738 - Family Primary Care I Credits: 2
• NURS 742 - Family Primary Care Practicum I Credits: 3
• NURS 739 - Family Primary Care II Credits: 4
• NURS 744 - Family Primary Care Practicum II Credits: 3
• NURS 741 - Family Primary Care III Credits: 3
• NURS 749 - Family Primary Care Practicum III Credits: 5

Total: 34 credits
▲ Nursing Administration Concentration (NUAD)

Required Courses (12 credits)

- NURS 763 - Administrative Theory in Nursing Credits: 3
- NURS 765 - Practicum in Nursing Administration I Credits: 3
- NURS 766 - Administrative Strategies in Nursing Credits: 3
- NURS 768 - Practicum in Nursing Administration II Credits: 3

Nursing Administration Support Courses (12 credits)

Choose one of the following financial management courses:
- NURS 654 - Nursing Administration Financial Management Credits: 3
- HAP 703 - Financial Management in Health Systems Credits: 3

One management/organizational theory course:
- HAP 621 - Management of Health Service Organizations Credits: 3

- Nursing or related discipline electives (6 credits)

Total: 24 credits

▲ Nurse Educator Concentration (NURE)

Level II Courses Core (8 credits)

- NURS 556 - Principles of Assessment and Evaluation in Nursing Education Credits: 3
- NURS 714 - Health Assessment in Clinical Practice Credits: 2
- NURS 769 - Physiology and Pathophysiology in Advanced Practice Credits: 3

Required Courses (12 credits)

- NURS 726 - Perspectives in Nursing Education Credits: 3
- NURS 727 - Application of Nursing Education Principles to Curriculum and Program Development Credits: 3
• NURS 728 - Practicum and Seminar in Nursing Education I Credits: 3
• NURS 729 - Practicum and Seminar in Nursing Education II Credits: 3

Elective Courses (6 credits)

Six credits in Nursing and related disciplines.

Total: 26 credits

Total: 30-49 credits

RN-to-MSN Pathway

This pathway allows RNs who have completed the general education requirements (as listed in the undergraduate RN-to-MSN Pathway described in the Nursing, BSN program) and have demonstrated substantial involvement in professional nursing within the past two years to earn the MSN degree. Students entering a concentration through this pathway must meet all the requirements for admission to that concentration.

In addition to fulfilling admission requirements for degree status at Mason, applicants must hold a current state-based/US license to practice nursing, be graduates of an accredited nursing program, have earned a 3.00 GPA in the nursing prerequisite and general education courses at an accredited institution, and demonstrate substantial involvement in professional nursing within the past two years as an RN in clinical practice.

Students in the RN-to-MSN pathway are required to take the following bridge course:

• NURS 595 - RN to MSN Transition: Evidence Based Community Health Nursing Credits: 3

After completion of the bridge course, students choose one of the concentrations and meet all requirements of the graduate program.

Master’s Level Certificate

Forensic Nursing Graduate Certificate

Banner Code: HH-CERG-FRNN

Unit: School of Nursing

This program provides advanced education at the graduate level to students who are actively involved or wish to pursue a career in forensic nursing. The certificate will provide the educational requirements for certification as a sexual assault nurse examiner (SANE) through the International Association of Forensic Nurses (IFAN) and as a certified forensic nurse through the American College of Forensic Examiners (ACFE).
Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in forensic nursing may be pursued only on a part-time basis.

Certificate Requirements

Applicants must have a current nursing license and a bachelor’s degree from an accredited institution of higher education. Courses are open to other graduate students, with the exception of NURS 734, which requires students to have a current nursing license.

Candidates must have 15 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses

- NURS 733 - Introduction to Forensic Science Credits: 3
- NURS 734 - Role of the Sexual Assault Nurse Examiner and Interpersonal Violence Credits: 3
  Students who are currently certified as a SANE take GCH 602 Global Health Issues Related to Violence in place of NURS 734.
- NURS 735 - Crime Lab and Crime Scene Investigation Credits: 3
- NURS 736 - Psychological and Legal Aspects of Forensic Science Credits: 3
- NURS 737 - Investigation of Injury and Death Credits: 3

Total: 15 credits

Nursing Administration Graduate Certificate

Banner Code: HHI-CERG-NUAD

Unit: School of Nursing

This program offers formal study in theory and practice in nursing administration in the health care delivery system.

Admission Requirements

Applicants must hold a master's degree in nursing. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. The
application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

The graduate certificate in nursing administration may be pursued only on a part-time basis.

Certificate Requirements

Candidates must have 15 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses

- NURS 763 - Administrative Theory in Nursing Credits: 3
- NURS 765 - Practicum in Nursing Administration I Credits: 3
- NURS 766 - Administrative Strategies in Nursing Credits: 3
- NURS 768 - Practicum in Nursing Administration II Credits: 3

Choose one of the following:

- NURS 654 - Nursing Administration Financial Management Credits: 3
- HAP 703 - Financial Management in Health Systems Credits: 3

Total: 15 credits

Nursing Education Graduate Certificate

Banner Code: HH-CERG-NUED

Unit: School of Nursing

This program combines foundation courses in education with courses in the principles and practices of nursing education. It prepares students to function in nursing educational roles in academic and nonacademic settings.

Admission Requirements

Applicants must hold a master's degree in nursing. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

The graduate certificate in nursing education may be pursued only on a part-time basis.

Certificate Requirements

Candidates must have 15 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.
Required Courses

- NURS 556 - Principles of Assessment and Evaluation in Nursing Education Credits: 3
- NURS 726 - Perspectives in Nursing Education Credits: 3
- NURS 727 - Application of Nursing Education Principles to Curriculum and Program Development Credits: 3
- NURS 728 - Practicum and Seminar in Nursing Education I Credits: 3
- NURS 729 - Practicum and Seminar in Nursing Education II Credits: 3

Total: 15 credits

Notes:

Students who qualify for a 3-credit practicum because of their educational experience may choose the remaining 3 credits from courses designated by the graduate nursing program.

Doctoral Degree

Nursing, DNP

Banner Code: HH-DNP-NURS

Unit: School of Nursing

The Doctor of Nursing Practice (DNP) builds on the MSN degree. The objective of the program is to prepare graduates for the highest level of nursing practice. Emphasis will be placed on evaluating and applying the evidence that supports practice, understanding and creating practice delivery systems based on patient outcomes, and assuming leadership roles in practice settings. In the curriculum, five concentrations are available to the post-baccalaureate student. The concentrations are configured into two foci as recommended by the AACN DNP Essentials: 1) care of individuals with three concentrations, Family Nurse Practitioner, Adult-Gerontology Nurse Practitioner, and Family Psychiatric Mental Health Nurse Practitioner; and 2) care of aggregates (groups) with Advanced Clinical Nursing and Administration in Nursing concentrations. BSN to DNP students must complete Level I core and advanced-practice competency courses relevant to their chosen concentration prior to taking Level II core essentials. The DNP is the terminal practice degree in the profession. The degree will draw on expertise from throughout CHHS in such areas as health economics, health policy, and epidemiology. Graduates of the program will be able to assume many roles in the health care system, including direct patient care, clinical nursing faculty, practice management, and policy development.

Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. Applicants for the BSN to DNP curriculum must be graduates of accredited baccalaureate programs in nursing. Applicants for the MSN to DNP curriculum must have a master’s degree in nursing. All applicants must hold an active state-based/US license as a registered nurse (RN), and show evidence of one year of
experience as an RN prior to enrollment in clinical course work. The application process is competitive, and applications are considered for the fall semester only. For application deadlines and detailed application requirements please refer to Graduate Application Database.

Transfer of Credit

Students may transfer a maximum of 9 credits into the DNP program from graduate courses taken at other institutions or taken at Mason in nondegree status, including courses offered through the college’s Academic Outreach program. Transfer credit is governed by university transfer of graduate credit policy and the university requirements for doctoral degrees, and transfer credit must be approved by the program director and the dean. Students who enroll initially through Nondegree Studies or the Academic Outreach program should seek course advising through the department and should submit their application to the DNP program as soon as possible after beginning in their study in nondegree status.

Reduction of Credit

Students who come into the MSN to DNP program will complete 72 credits, including up to 30 hours of relevant graduate credit awarded for past master's-level courses.

Time Requirements

The projected length of the program for full-time BSN to DNP students is three calendar years, which could stretch to eight academic years for part-time students. Full-time MSN to DNP students can complete in two academic years, while part-time students may require three academic years. BSN to DNP students will have a maximum of eight years and MSN to DNP students will have a maximum of six years to complete the program.

Degree Requirements

The BSN to DNP curriculum is comprised of 72 credits divided among Level I core courses, advanced practice competency courses, Level II core essentials, clinical practicums and a practice inquiry project. Students who come into the MSN to DNP program will also complete 72 credits, including up to 30 hours of relevant graduate credit awarded for past master's-level courses.

Of the 72 required credits, all students will have 28 total credits of core content (Level I core and Level II core essentials). Core content focuses on informatics, financial management, health policy, theory, ethics, leadership and application of research. Students also must take 36 credits of advanced practice competency courses and 8 credits of a practice-based translational inquiry (practice inquiry project). These credits count toward the AACN DNP Essential minimum of 1,000 hours of precepted/mentored clinical practice.

The 1,000 hours of precepted/mentored clinical practice are distributed among introductory (500- to 700-numbered courses) and upper level (800- to 900-numbered courses) graduate courses. Students receive one hour of credit for 45 hours of precepted/mentored clinical practice that is part of the coursework. BSN to DNP students will include the 1,000 hours in their coursework. MSN to DNP students can transfer in up to 800 hours (depending on how many hours they accrued during their master's program). The number of clinical hours a student is awarded on admission is based on transcripts and course descriptions. Faculty will review clinical credits earned as part of the master's degree to determine the number of clinical hours awarded. Variable hours in the clinical practicums (NURS 921 and NURS 922) will assure a total of 1,000 clinical hours prior to DNP graduation.

Students will pursue one of two emphases: (1) Advanced nursing care of individuals, or (2) Advanced nursing care of aggregates. Students will integrate knowledge from core and concentration courses into development and implementation of their practice inquiry project.
The curriculum will allow students with diverse nursing academic and clinical backgrounds the flexibility to enter a program of study tailored to their future professional goals. The final project will be an evidence-based translational research project (practice inquiry project). This project is designed for students to address a real-life professional issue with potential for actual implementation to improve practice and outcomes. The goal of the DNP program is to maximize the strength and credentials of each student through faculty advisement. Students will be assigned to a faculty advisor whose interest and expertise will support the development of an individual practice inquiry project at the culmination of course work. All students are required to have an active Mason e-mail account.

BSN to DNP Curriculum (72 credits)

Level I core courses and advanced practice competency courses must be completed in the first two years of full-time study or four years of part-time study. These foundational courses prepare the student to develop and implement the practice inquiry project in the final two semesters of study.

Level I Core Courses (12 credits)

- NURS 665 - Theoretical and Ethical Foundations Related to Nursing Credits: 3
- NURS 688 - Organization of Nursing and Health Care Delivery Systems Credits: 3
- NURS 757 - Nursing Research and Biostatistics I Credits: 3
- NURS 758 - Nursing Research and Biostatistics II Credits: 3

Level II Core Essentials Courses (16 credits)

One of:

- NURS 654 - Nursing Administration Financial Management Credits: 3
  NURS 654 is required for concentrations in Advanced Clinical Nursing, Nursing Administration, Adult-Gerontology Nurse Practitioner, and Family Nurse Practitioner
- NURS 643 - Community-Oriented Primary Care Credits: 3
  NURS 643 is required for the Family Psychiatric Mental Health Nurse Practitioner concentration
- NURS 715 - Nursing Informatics Inquiry Credits: 3
- NURS 808 - Translating Nursing and Health Care Research into Evidence-Based Policy Credits: 3
- NURS 870 - Nursing and Health Care Administration I Credits: 3
- NURS 883 - Evidence-Based Practice in Nursing and Healthcare Credits: 4

Advanced Practice Competency Courses (36 credits)

Concentrations in Advanced Nursing Care of Aggregates
Advanced Clinical Nursing Concentration (NUAC)

- NURS 513 - Advanced Pharmacology in Nursing Credits: 3
- NURS 613 - Advanced Health Assessment Credits: 2
- NURS 618 - Pathophysiology: Health and Illness Credits: 3
- NURS 740 - Clinical Nurse Specialist Internship Credits: 3
- NURS 773 - Clinical Applications of Theory in Advanced Clinical Nursing Credits: 3
- NURS 775 - Advanced Specialty Practice I Credits: 3
- NURS 776 - Development of Advanced Practice Nursing Role Credits: 3
- NURS 778 - Advanced Specialty Practice II Credits: 3
- NURS 921 - Clinical Practicum I Credits: 1-10
- NURS 922 - Clinical Practicum II Credits: 1-10

Total: 36 credits

Nursing Administration Concentration (NUAD)

- NURS 763 - Administrative Theory in Nursing Credits: 3
- NURS 765 - Practicum in Nursing Administration I Credits: 3
- NURS 766 - Administrative Strategies in Nursing Credits: 3
- NURS 768 - Practicum in Nursing Administration II Credits: 3
- NURS 871 - Nursing and Health Care Administration II Credits: 2
- NURS 874 - Internship in Health Care Administration/Policy/Education Credits: 4
- NURS 921 - Clinical Practicum I Credits: 1-10
- NURS 922 - Clinical Practicum II Credits: 1-10
  Electives toward career goal (8 credits). All electives must be approved by advisor prior to the start of the course.

Total: 36 credits

Concentrations in Advanced Nursing Care of Individuals

Adult-Gerontology Nurse Practitioner (AGNP)

- NURS 714 - Health Assessment in Clinical Practice Credits: 2
- NURS 724 - Health Assessment Practicum Credits: 1
• NURS 761 - Pharmacotherapeutics Credits: 3
• NURS 769 - Physiology and Pathophysiology in Advanced Practice Credits: 3
• NURS 713 - Decision Making and Pharmacologic Management in Practice Credits: 2
• NURS 770 - Adult Primary Care I Credits: 3
• NURS 772 - Adult Primary Care Practicum I Credits: 3
• NURS 771 - Adult Primary Care II Credits: 4
• NURS 774 - Adult Primary Care Practicum II Credits: 4
• NURS 780 - Practicum in Gerontological Nursing I Credits: 3
• NURS 781 - Practicum in Gerontological Nursing II Credits: 3
• NURS 921 - Clinical Practicum I Credits: 1-10
• NURS 922 - Clinical Practicum II Credits: 1-10

Total: 36 credits

▲ Family Nurse Practitioner Concentration (FNUP)

• NURS 714 - Health Assessment in Clinical Practice Credits: 2
• NURS 724 - Health Assessment Practicum Credits: 1
• NURS 761 - Pharmacotherapeutics Credits: 3
• NURS 769 - Physiology and Pathophysiology in Advanced Practice Credits: 3
• NURS 713 - Decision Making and Pharmacologic Management in Practice Credits: 2
• NURS 738 - Family Primary Care I Credits: 2
• NURS 742 - Family Primary Care Practicum I Credits: 3
• NURS 739 - Family Primary Care II Credits: 4
• NURS 744 - Family Primary Care Practicum II Credits: 3
• NURS 741 - Family Primary Care III Credits: 3
• NURS 749 - Family Primary Care Practicum III Credits: 5
• NURS 921 - Clinical Practicum I Credits: 1-10
• NURS 922 - Clinical Practicum II Credits: 1-10

Total: 36 credits

▲ Family Psychiatric Mental Health Nurse Practitioner Concentration (FPMH)

• NURS 713 - Decision Making and Pharmacologic Management in Practice Credits: 2
• NURS 714 - Health Assessment in Clinical Practice Credits: 2
• NURS 724 - Health Assessment Practicum Credits: 1
• NURS 761 - Pharmacotherapeutics Credits: 3
• NURS 769 - Physiology and Pathophysiology in Advanced Practice Credits: 3
Practice Inquiry Project Courses (8 credits)

The final step in completion of the degree is the implementation of a practice inquiry project. The proposal for this project must be prepared with ample time for submission to the Human Subjects Review Board at George Mason University. The student's project will be evaluated by a committee consisting of three members who will be agreed upon by the student and advisor. The student will identify one School of Nursing faculty member to serve as an advisor and chair the committee. Another committee member will be identified either from GMU faculty or from outside the university with permission from the committee chair and the coordinator of the DNP program. The third committee member will be identified from the site of the student's practice inquiry project. The committee is responsible for approving the final written report of the project and the oral defense by the student. Consistent with the AACN DNP Essentials, the practice inquiry project must demonstrate to the committee's satisfaction knowledge in the core competencies of finance, policy, technology, and health care delivery systems, as well as utilization of evidence to enhance practice outcomes. The practice inquiry project will be completed within two semesters. Students unable to complete the project within this time frame may take up to one extra year.

- NURS 980 - Practice Inquiry I Credits: 4
- NURS 981 - Practice Inquiry II Credits: 4

MSN to DNP Curriculum (72 credits)

Students who come into the MSN to DNP program will complete 72 credits. Up to 30 hours of relevant graduate credit may be awarded for past master's-level courses, and students will complete the minimum of 42 additional credits following the curriculum below.

In this program, Level II core essentials build on previous master's education and must be completed in the first year of full-time study or two years of part-time study. They prepare the student to develop and implement the practice inquiry project in the final two semesters of study. The core content for post-master's DNP students will be individualized based on the content from the student's master's degree academic program and will include a minimum of 19 credits.

Students must complete 1,000 precepted/mentored clinical hours including those obtained during previous master's education (individually awarded based on evaluation of master's clinical hours). Students also must take additional electives to meet the total requirement of 72 credits required to complete the program.

Level II Core Essentials Courses (19 credits)
- NURS 654 - Nursing Administration Financial Management Credits: 3
- NURS 715 - Nursing Informatics Inquiry Credits: 3
- NURS 758 - Nursing Research and Biostatistics II Credits: 3
- NURS 808 - Translating Nursing and Health Care Research into Evidence-Based Policy Credits: 3
- NURS 870 - Nursing and Health Care Administration I Credits: 3
- NURS 883 - Evidence-Based Practice in Nursing and Healthcare Credits: 4

**Advanced Practice Competency Courses (2-20 credits)**

- NURS 921 - Clinical Practicum I Credits: 1-10
- NURS 922 - Clinical Practicum II Credits: 1-10

**Practice Inquiry Project Courses (8 credits)**

The final step in completion of the degree is the implementation of a practice inquiry project. The proposal for this project must be prepared with ample time for submission to the Human Subjects Review Board at George Mason University. The student's project will be evaluated by a committee consisting of three members who will be agreed upon by the student and advisor. The student will identify one School of Nursing faculty member to serve as an advisor and chair the committee. Another committee member will be identified either from GMU faculty or from outside the university with permission from the committee chair and the coordinator of the DNP program. The third committee member will be identified from the site of the student's practice inquiry project. The committee is responsible for approving the final written report of the project and the oral defense by the student. Consistent with the *AACN DNP Essentials*, the practice inquiry project must demonstrate to the committee's satisfaction knowledge in the core competencies of finance, policy, technology, and health care delivery systems, as well as utilization of evidence to enhance practice outcomes. The practice inquiry project will be completed within two semesters. Students unable to complete the project within this time frame may take up to one extra year.

- NURS 980 - Practice Inquiry I Credits: 4
- NURS 981 - Practice Inquiry II Credits: 4

**Electives**

Elective courses should be taken to complete the required number of program hours. All electives must be approved by advisor prior to the start of the course.

**Total: 72 credits**

**Nursing, PhD**

*Banner Code: HH-PHD-NURS*
Unit: School of Nursing

The PhD in Nursing program builds on the MSN degree and requires a total of 78 credit hours of work (a minimum of 48 credit hours beyond the master’s). The objective of the program is to prepare nurses for leadership roles in a variety of organizations, health-related agencies and educational institutions. Graduates of the program conduct and support research in nursing and health care and influence the formation and implementation of public policy in health care through analysis of sociocultural, economic, fiscal, political, ethical, and governmental processes.

Admission Requirements

Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. Nursing PhD applicants must hold a master’s degree in nursing from an accredited program equivalent to 30 credits or a master’s degree in a related health field with a baccalaureate degree in nursing. The application process is competitive, and applications are considered for the fall semester only. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

Reduction of Credit

Students must have a master’s degree before being admitted to the PhD in Nursing program. Up to 30 hours of relevant graduate credit may be awarded for past master's-level courses, and students will complete the minimum of 48 additional credits following the curriculum below.

Transfer of Credit

Students may transfer a maximum of 9 credits into the PhD in Nursing program from graduate courses taken at other institutions or taken at Mason in non-degree status, including courses offered through the college’s Academic Outreach program. Transfer credit is governed by university transfer of graduate credit policy and the university requirements for doctoral degrees, and transfer credit must be approved by the assistant dean of the doctoral division and by the dean. Students who enroll initially through Non-degree Studies or the Academic Outreach program should seek course advising through the department and should submit their application to the PhD program as soon as possible after beginning in their study in non-degree status.

Program Requirements

To complete the PhD in nursing, students must:

- Complete the program of study outlined in the PhD curriculum.
- Pass written doctoral candidacy comprehensive exam after completing all PhD credit requirements, except NURS 998 and 999.
- Pass the final oral dissertation defense and submit a doctoral dissertation approved by the doctoral dissertation committee, the Assistant Dean of the doctoral program, and the Director of the School of Nursing. (The dissertation is submitted in the approved format to University Libraries and the director of the doctoral program.)
- Complete application material for graduation in accordance with prevailing Mason policies.

Time Requirements

Students must complete all planned course work, including electives, and advance to candidacy within six years of admission to degree or provisional status in the PhD program. The student must successfully complete the doctoral dissertation, final oral doctoral exam, and all PhD degree requirements within five years following the semester of advancement to candidacy.
Degree Requirements

The PhD in Nursing program offers an individualized area of concentration (minimum 48 credits) based on the student's interests and career goals. A student develops his/her program of research through required coursework, selection of supporting electives, independent studies, and dissertation research.

▲ Concentration in Individualized Study (INDV)

Scientific Base/Research Core (27 credits)

- NURS 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3
- NURS 805 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3
- NURS 807 - Measurement Theories and Applications in Health Care Research Credits: 3
- NURS 809 - Research Design and Methods in Nursing and Health Care Credits: 3
- NURS 875 - Research Internship Credits: 3
- NURS 920 - Qualitative Research in Nursing and Health Care Credits: 3
- NURS 930 - Quantitative Methods in Nursing and Health Care Credits: 3
- NURS 955 - Philosophical Bases of Inquiry Credits: 3
- NURS 957 - Ethics of Health Care Research Credits: 3

Cognate Courses (9 credits)

Students must complete a cohesive set of existing doctoral-level university cognate courses designed with advisor and program director to contribute to the student’s program of research. Examples may include coursework in areas such as: women's health, sleep symptoms in aging populations, mental health issues post traumatic brain injury, depression in diverse populations, maternal and child health, preventive care, quality indicators, nursing administration, research methodologies, and biostatistics. These are just suggested areas and not intended to be collectively exhaustive.

Dissertation (minimum 12 credits combined)

Before advancing to candidacy and enrolling for dissertation credit (12 credits), students must have their program of study approved by the Assistant Dean of the doctoral program.

Advancement to Candidacy

After students have completed all required course work and the qualifying exam, the director of the School of Nursing approves advancement to candidacy.

Dissertation Proposal

The proposal must focus on a research topic in nursing or health care and be approved by the doctoral dissertation committee, the Assistant Dean of the doctoral program, and the Director of the School of Nursing. The dissertation proposal and dissertation must be consistent with the guidelines outlined in Mason’s Guide for Preparing Graduate Theses, Dissertations, and Projects.
• **NURS 998 - Doctoral Dissertation Proposal Credits: 1-9**
  Students must enroll for 3 credits the first time NURS 998 is taken.

**Doctoral Dissertation**

Before enrolling for dissertation credit, the student must have advanced to candidacy. The completed dissertation must be approved by the doctoral dissertation committee, the Assistant Dean of the doctoral program, and the Director of the School of Nursing.

• **NURS 999 - Doctoral Dissertation Credits: 1-9**

**Final Oral Doctoral Exam**

The doctoral dissertation committee chair, on preliminary approval of the doctoral dissertation by the committee, petitions the Assistant Dean of the doctoral program in the School of Nursing to schedule the final oral doctoral exam, which includes a defense of the doctoral dissertation. The final oral exam also demonstrates the candidate’s intellectual command and maturity of judgment in the area of emphasis chosen by the candidate and approved by the dissertation committee. At the close of the final oral exam, the committee makes a final judgment regarding approval of the doctoral dissertation and completion of PhD degree requirements.

**Concentration Total: 48 credits**

**Total: 78 credits**

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**Global and Community Health**

Phone: 703-993-3126  
web: globalcommhealth.gmu.edu

**Faculty**

**Professors:** Howell (associate dean for research and program evaluation), Metcalf, Sluzki, Whittington (senior associate dean for academic affairs), Zimmerman (chair)

**Associate Professors:** Baghi, Jacobsen, Lindley, Mink

**Assistant Professors:** Dawson, Freeborne, Frankenfeld, Rosenberger

The Department of Global and Community Health (GCH) is a department within the College of Health and Human Services (CHHS). The educational mission of GCH is to provide undergraduate and graduate degrees and certificates in health-related disciplines centered in global and community health issues. Its research mission is to promote and develop solid and meaningful research programs that help define and address health issues and the needs of affected populations at the regional and global level. Its service mission is to increase the awareness of these problems, enhance health-promoting information, and collaborate with other organizations toward enhancing local, national, and global health. Part-time students are encouraged to take at least 6 credits per semester to promote timely completion of the program.

**Undergraduate Degree**
Community Health, BS

Banner Code: HH-BS-COMH

Unit: Global and Community Health

This degree prepares students with a basic understanding of public health, the health care system, and public health issues and policies related to health promotion, disease prevention, and public health education specific to local and international populations of all sizes.

Public health and community health professionals work in partnership with private and public organizations and are expected to confront complex behavioral, cultural, and social health issues within communities. The skills and knowledge gained through this program will prepare graduates to address the local, national, and global health needs of diverse populations, providing understanding, education, monitoring, evaluation, and interventions within a community setting.

Students majoring in Community Health may elect one of four specializations: Global Health, Health Education, Nutrition, or Pre-Health Professions. The program may be completed on a full-time or part-time basis. Interested students are encouraged to contact the Department of Global and Community Health before admission.

A criminal background check may be required of students prior to beginning the internship if the organization requires one. A minimum grade of C must be maintained in all major courses. Students may substitute two 3-credit GCH courses for the internship with their advisor’s approval.

Degree Requirements

General Education (38 credits)

Written Communication:

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.

Oral Communication:

Choose one:

- COMM 100 - Public Speaking Credits: 3
- COMM 101 - Interpersonal and Group Interaction Credits: 3

Quantitative Reasoning:

- STAT 250 - Introductory Statistics I Credits: 3
Information Technology:

- An approved University General Education information technology course.

Literature:

- An approved University General Education literature course.

Arts:

- An approved University General Education arts course.

Natural Science:

Required for the Health Education, Global Health, Nutrition, and Pre-Health Professions concentrations:
- BIOL 124 - Human Anatomy and Physiology Credits: 4
- BIOL 125 - Human Anatomy and Physiology Credits: 4

Additional options for Pre-Health Professions concentration:
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 311 - General Genetics Credits: 4

Western Civilization:

Choose one of the following:
- HIST 100 - History of Western Civilization Credits: 3
- HIST 125 - Introduction to World History Credits: 3

Global Understanding:

- GCH 205 - International Health Credits: 3

Social Science:

- PSYC 100 - Basic Concepts in Psychology Credits: 3

Community Health Major Core (30 credits)

- GCH 332 - Health and Disease Credits: 3
- GCH 350 - Health Education Credits: 3
- GCH 360 - Health and Environment Credits: 3
• GCH 411 - Health Program Planning Credits: 3  
• GCH 412 - Fundamentals of Epidemiology Credits: 3  
• GCH 430 - Community Health Systems and Agencies Credits: 3  
• GCH 460 - Program Evaluation Credits: 3  
• HAP 301 - Health Care Delivery in the United States Credits: 3  
• HAP 465 - Integration of Professional Skills and Issues Credits: 3  
• NUTR 295 - Nutrition for Health Professionals Credits: 3

Concentrations: Complete One

▲ Global Health Concentration (GLOH): 28 credits

The global health concentration is designed for students interested in global public health and is particularly focused on improving health conditions in developing countries.

• GCH 310 - Health Behavior Theories Credits: 3  
• GCH 405 - International Health Policy and Practice Credits: 3  
• BIOL 246 - Introductory Microbiology Credits: 3  
• BIOL 306 - Biology of Microorganisms Laboratory Credits: 1

Foreign Language (0-9 credits)

Intermediate-level proficiency in one foreign language. This requirement may be fulfilled by completing a course in a foreign language numbered 202, 209, or 210 (or higher courses taught in the language) or achieving a satisfactory score on an approved proficiency test. Students who are already proficient in a second language may be eligible for a waiver of this requirement. If this requirement is waived, the student may need to take up to an additional 9 credits of electives. Additional information on this waiver may be found at: chhs.gmu.edu/gch/forms

Global Health Electives (9-18 credits)

Students should select from the following list or get advisor approval:

• ANTH 381 - Medical Anthropology Credits: 3  
• BIOL 301 - Biology and Society Credits: 3  
• CONF 340 - Global Conflict Analysis and Resolution Credits: 3  
• CONF 341 - Global Conflict Resolution Practice Credits: 1  
• ECON 360 - Economics of Developing Areas Credits: 3  
• EVPP 336 - Human Dimensions of the Environment Credits: 3  
• EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3  
• GGS 304 - Populations Dimensions of Global Change Credits: 3  
• GGS 322 - Issues in Global Change Credits: 3  
• GCH 450 - Culture, Sexuality and the Global AIDS Epidemic Credits: 3  
• GCH 320 - Community Health and Literature Credits: 3  
• GCH 498 - Global and Community Health Internship Credits: 6  
• PSYC 379 - Applied Cross-Cultural Psychology Credits: 3  
• RELI 341 - Global Perspectives on Spirituality and Healing Credits: 3
- SOCI 320 - Social Structure and Globalization Credits: 3
- STAT 350 - Introductory Statistics II Credits: 3 or STAT 362 - Introduction to Computer Statistical Packages Credits: 3

▲ Health Education Concentration (HEAL): 27 credits

The health education concentration prepares students to enter a career in health education and to sit for the professional health educators’ licensure exam.

- GCH 310 - Health Behavior Theories Credits: 3
- HEAL 372 - Health Communication Credits: 3 or equivalent course
- GCH 445 - Social Determinants of Health Credits: 3
- GCH 462 - Health Promotion across the Lifespan Credits: 3
- PSYC 231 - Social Psychology Credits: 3

Health Education Electives (12 credits)

Students should select from the following list or get advisor approval:

- ANTH 381 - Medical Anthropology Credits: 3
- BIOL 301 - Biology and Society Credits: 3
- GCH 320 - Community Health and Literature Credits: 3
- GCH 370 - Sexuality and Human Behavior Credits: 3
- GCH 480 - Health Maintenance and Health Aspects of Aging Credits: 3
- GCH 498 - Global and Community Health Internship Credits: 6
- HEAL 310 - Drugs and Health Credits: 3
- HEAL 325 - Health Aspects of Human Sexuality Credits: 3
- HEAL 327 - Women's Health Credits: 3
- NUTR 420 - Strategies for Nutrition Education Credits: 3
- PSYC 321 - Counseling Psychology Credits: 3
- PSYC 325 - Abnormal Psychology Credits: 3
- PSYC 326 - Therapeutic Communication Skills Credits: 3
- PSYC 330 - Psychology of Adjustment Credits: 3
- SOCI 390 - Sociology of Health, Illness, and Disability Credits: 3
- SOCW 410 - Alcohol and Substance Abuse: Policies and Programs Credits: 3
- STAT 350 - Introductory Statistics II Credits: 3 or STAT 362 - Introduction to Computer Statistical Packages Credits: 3

▲ Nutrition Concentration (NUTR): 28 credits

The nutrition concentration is designed for students interested in community nutrition. Students will develop an understanding of nutrition issues and intervention.

- NUTR 420 - Strategies for Nutrition Education Credits: 3
- NUTR 421 - Community Nutrition Credits: 3
- NUTR 422 - Nutrition throughout the Life Cycle Credits: 3
- NUTR 423 - Nutrition and Chronic Illnesses Credits: 3
- NUTR 466 - Nutrition and Weight Management: Obesity, Anorexia, and Bulimia Credits: 3
• BIOL 246 - Introductory Microbiology Credits: 3
• BIOL 306 - Biology of Microorganisms Laboratory Credits: 1

Nutrition Electives (9 credits)

Students should select from the following list or get advisor approval:

• CHEM 102 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 3
• GCH 310 - Health Behavior Theories Credits: 3
• GCH 445 - Social Determinants of Health Credits: 3
• GCH 480 - Health Maintenance and Health Aspects of Aging Credits: 3
• GCH 498 - Global and Community Health Internship Credits: 6
• NUTR 583 - Biocultural Perspectives on Food and Nutrition Credits: 3
• STAT 350 - Introductory Statistics II Credits: 3 or STAT 362 - Introduction to Computer Statistical Packages Credits: 3

▲ Pre-Health Professions Concentration (PRHP): 29-30 credits

The pre-health professions concentration prepares students to apply for graduate programs in the health professions such as medical school, dentistry school, veterinary school, and physical therapy programs. This concentration does not guarantee entrance into a graduate health professional program. It is important to note that, depending on the type of graduate program that students are interested in, additional coursework may be required. It is the student's responsibility to determine the essential criteria for admission to their target schools in consultation with the health professions advising office.

• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• PSYC 325 - Abnormal Psychology Credits: 3

Choose one of the following:
• PSYC 211 - Developmental Psychology Credits: 3
• GCH 445 or SOCW 445 - Social Determinants of Health Credits: 3

Choose one of the following:
• MATH 106 - Quantitative Reasoning Credits: 3
• MATH 113 - Analytic Geometry and Calculus I Credits: 4

Pre-Health Professions Electives (12 credits)

Four courses as approved by the department.

Electives (22-25 credits)

Total: 120 credits

Undergraduate Minor
Public Health Minor

Banner Code: PUBH

Unit: Global and Community Health

The public health minor will provide students with a basic understanding of each of the core areas of public health, will introduce students to career opportunities in the fields of global and community health, and will prepare students for admission to graduate programs in public health.

Course Work

Students should consult the Academic Policies section of this catalog for more information on the university-wide requirements for minors.

Minor Requirements

Required Courses (18 credits)

- GCH 205 - International Health Credits: 3
- GCH 412 - Fundamentals of Epidemiology Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3
- GCH 360 - Health and Environment Credits: 3

Choose one from the following:
- GCH 310 - Health Behavior Theories Credits: 3
- GCH 350 - Health Education Credits: 3

Choose one from the following:
- GCH 405 - International Health Policy and Practice Credits: 3
- HAP 301 - Health Care Delivery in the United States Credits: 3

Total: 18 credits

Master's Degree

Epidemiology and Biostatistics, MS

Banner Code: HH-MS-EBST

Unit: Global and Community Health
This program prepares participants to apply epidemiological and statistical principles to quantitative analysis of health issues. It will prepare health scientists to work as professionals in health-related government agencies, pharmaceutical companies, research hospitals, public health agencies, and other health-related organizations that need to analyze data and design experiments for medical and public health research. Graduates are expected to analyze and interpret increasingly complex health data.

Application Requirements

Admission to the program is competitive, and a variety of criteria are evaluated in the admissions process: undergraduate academic performance, recent post-baccalaureate course work, work experience, professional goals, and letters of recommendation. Applicants must hold a baccalaureate degree in a discipline related to health science or statistics with undergraduate calculus through multivariate calculus with a B or better (equivalent to Math 113, 114, and 213), and a calculus-based probability course such as STAT 346.

Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. Applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

Transfer of Credit

Transfer credit is governed by university transfer of graduate credit policy and the university requirements for master’s degrees, and transfer credit must be approved by the program director and the dean. Students who enroll initially through Nondegree Studies should seek course advising through the department prior to taking a course and plan to submit their application to the MS program in their first semester of study.

Degree Requirements

Students must complete 36 credits of graduate course work. A graduate course in which a grade of C or below is earned may be repeated only once. Graduate students may repeat no more than two courses in their stated program of study. Students must achieve a minimum 3.00 GPA to graduate.

Core Requirements (18 credits)

- GCH 712 - Introduction to Epidemiology Credits: 3
- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 560 - Biostatistical Methods Credits: 3

Epidemiology Electives (6 credits)

Select a minimum of two courses from the following:

- GCH 605 - Social Epidemiology Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3
- GCH 726 - Advanced Methods in Epidemiology Credits: 3
Statistics Electives (6 credits)

Select a minimum of two courses from the following:

- STAT 652 - Statistical Inference Credits: 3
- STAT 655 - Analysis of Variance Credits: 3
- STAT 656 - Regression Analysis Credits: 3
- STAT 657 - Nonparametric Statistics Credits: 3
- STAT 662 - Multivariate Statistical Methods Credits: 3
- STAT 663 - Statistical Graphics and Data Exploration I Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3
- STAT 668 - Survival Analysis Credits: 3
- STAT 773 - Statistical Methods for Longitudinal Data Analysis Credits: 3

Electives (6 credits)

- Choose two electives (6 credits) in consultation with the academic advisor. Students may choose to work with their advisor to conduct an epidemiology/biostatistics research project.

Total: 36 credits

Global Health, MS

Banner Code: HH-MS-GLOH

Unit: Global and Community Health

This degree incorporates epidemiology and biostatistics, region-based nutrition, cross-cultural perspectives on health issues, community health assessment, program evaluation, international health systems and organizations, and international health research. Practicum or thesis options allow students to explore current dilemmas, demands, and health services with a global focus and perspective.

Graduates of this program will be given the knowledge base and skills to work and conduct research within the global health environment. Through course work and experiential learning, students will be prepared to work in the diverse cultural and multidisciplinary environments inherent in global health. Students will learn about the fundamentals of global public health, including epidemiology, environmental health, global health policies, and sociocultural influences on health and behavior. Students will also be trained in how to collaborate among nonprofit, governmental, and business sectors. Graduates will be prepared to work in international health organizations such as nongovernmental organizations (NGOs), governmental organizations, and multilateral organizations, or may choose to pursue a research pathway and continue toward a terminal degree.

Admission Requirements
Admission to the program is competitive, and a variety of criteria are evaluated in the admissions process: GRE scores, undergraduate academic performance, recent post-baccalaureate course work, work experience, professional goals, and recommendations. Undergraduate courses in statistics, anthropology, sociology, and natural sciences are helpful. Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog, and apply using the online Application for Graduate Admission. Applications are considered for the fall semester only. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

Transfer of Credit

Transfer credit is governed by university transfer of graduate credit policy and the university requirements for master's degrees, and transfer credit must be approved by the program director and the dean. Students who enroll initially through Nondegree Studies should seek course advising through the department prior to taking a course and plan to submit their application to the MS program in their first semester of study.

Degree Requirements

Students complete a total of 42 credits of graduate course work, including either a practicum or a thesis option. A graduate course in which a grade of C or below is earned may be repeated only once. Graduate students may repeat no more than two courses. Students must maintain a 3.00 GPA to graduate from the master’s program.

Global Health Core (18 credits)

- GCH 543 - Global Health Credits: 3
- NUTR 630 - Global Nutrition Credits: 3
- GCH 640 - Global Infectious Diseases Credits: 3
- GCH 650 - Global Non-Communicable Diseases Credits: 3
- GCH 622 - Mental Health: A Global Perspective Credits: 3
- GCH 645 - U.S. and Global Public Health Systems Credits: 3 or HAP 609 - Comparative International Health Systems Credits: 3

Research Core (9 credits)

- GCH 601 - Introduction to Biostatistics Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3

Capstone Experience (3 - 6 credits)

Global Health students must select either the Practicum or Thesis option.

Practicum Option
For the practicum option, which entails the application of an idea or theory through fieldwork, students will be required to complete one practicum within a global health agency under the guidance of a preceptor and a faculty advisor. Students are encouraged to conduct the practicum abroad.

- GCH 780 - Practicum Seminar Credits: 0
- GCH 790 - Practicum in Public Health Credits: 3

**Thesis Option**

Thesis-option students will select a thesis director who will guide the work and be the ultimate judge of its acceptability. The director must be on the faculty of the Department of Global and Community Health. Thesis topics must complement one of the areas of GCH faculty expertise, which include epidemiology, biostatistics, mental health, social networks, health communication, and health behavior. Students must conduct an original research project that employs a standard research design to collect data and test a theory. Students must develop a research proposal and have it approved by their advisor before beginning the research project. Students must register for 6 hours of thesis research, but completion of these hours is not sufficient to satisfy the thesis requirement. The final thesis must conform to University Libraries guidelines.

- GCH 788 - Public Health Research I Credits: 3
- GCH 789 - Public Health Research II Credits: 3

**Global Health Electives (9 - 12 credits)**

Select 9 - 12 credits from this list, so that the total number of credits for the degree is at least 42.

- GCH 560 - Environmental Health Credits: 3
- GCH 602 - Global Health Issues Related to Violence Credits: 3
- GCH 605 - Social Epidemiology Credits: 3
- GCH 610 - Health Behavior Theory Credits: 3
- GCH 611 - Health Program Planning and Evaluation Credits: 3
- GCH 690 - Independent Study Credits: 1-3
- GCH 701 - Program Evaluation Credits: 3
- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- GCH 752 - Nutritional Epidemiology Credits: 3
- GCH 762 - Environmental Epidemiology Credits: 3
- GCH 795 - Special Topics in Global and Community Health Credits: 1-3
- ANTH 631 - Refugees in the Contemporary World Credits: 3
- ANTH 687 - Medical Anthropology Credits: 3
- COMM 705 - Intercultural Health and Risk Communication Credits: 3
- EVPP 637 - Human Dimensions of Global Change Credits: 3
- GLOA 610 - Economic Globalization and Development Credits: 3
- HAP 511 - Ethics in Public Health Credits: 3
- ITRN 718 - Global Economic and Human Development Credits: 3
- NUTR 520 - Introduction to Wine and Beer Credits: 3
- NUTR 583 - Biocultural Perspectives on Food and Nutrition Credits: 3
- PUAD 631 - Disaster Response Operations and Recovery Credits: 3
- PUAD 636 - The NGO: Policy and Management Credits: 3
Public Health, MPH

Banner Code: HH-MPH-PUBH

Unit: Global and Community Health

The Master of Public Health (MPH) emphasizes the core disciplines of public health – epidemiology, biostatistics, health administration and policy, social and behavioral sciences, and environmental health – and provides additional training in global applications. In addition to required coursework in each of the core disciplines and a mandatory practical experience, students will pursue a concentration in epidemiology or global and community health. The program is organized to prepare graduates for work in organizations that seek to improve public health at local, national, or global levels. Based upon guidelines set by the Council on Education for Public Health, the curriculum comprises 42 credit hours, distributed among the following categories of courses: Public Health Core (21 credits), MPH practicum requirements (3 credits), and a concentration (18 credits). Students must select one of two concentration areas: epidemiology or global and community health.

Admission Requirements

Admission to the program is competitive, and a variety of criteria are evaluated in the admissions process: undergraduate academic performance, recent post-baccalaureate course work, GRE scores, work experience, professional goals, and recommendations. Some background in statistics, biology, and the social sciences is preferred. Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. Applications are considered for the fall semester only. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

Transfer of Credit

Transfer credit is governed by university transfer of credit policy and the university requirements for master's degrees, and transfer credit must be approved by the program director and the dean. Students who enroll initially through Nondegree Studies should seek course advising through the department prior to taking a course and plan to submit their application to the MPH program in their first semester of study.

Degree Requirements

Students must complete 42 credits of graduate course work. Each course can be used to fulfill only one requirement toward the MPH degree. A graduate course in which a grade of C or below is earned may be repeated only once. Graduate students may repeat no more than two courses. Students must achieve a 3.00 GPA to graduate.

Public Health Core (21 credits)

- PUBP 757 - Public Policy in Global Health and Medical Practice Credits: 3
- PUBP 758 - Global Threats and Medical Policies Credits: 3
- SOAN 510 - Culture and Globalization Credits: 3
- WMST 640 - Women and Global Issues Credits: 3

Total: 42 credits
- GCH 543 - Global Health Credits: 3
- GCH 560 - Environmental Health Credits: 3
- GCH 600 - Health Promotion Methods Credits: 3
- GCH 601 - Introduction to Biostatistics Credits: 3
- GCH 645 - U.S. and Global Public Health Systems Credits: 3
- GCH 691 - Project Management in Public Health Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3
- GCH 792 - Culminating Experience Credits: 0

**Practicum Requirements (3 Credits)**

- GCH 780 - Practicum Seminar Credits: 0
- GCH 790 - Practicum in Public Health Credits: 3

**Concentrations: Complete One**

Students must complete one concentration from the following:

▲ **Epidemiology Concentration (EPID): 18 Credits**

Epidemiology is the study of the factors that influence the occurrence, distribution, prevention, and control of disease. The epidemiology concentration emphasizes the development of skills such as study design, data collection and management, data analysis and interpretation, and communication of research findings.

**Epidemiology Concentration Requirements:**

- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- GCH 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3

  **Choose one of the following courses:**
  - GCH 680 - International Research Ethics and Methods Credits: 3
  - GCH 726 - Advanced Methods in Epidemiology Credits: 3
  - GCH 805 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3

  **Choose one of the following courses:**
  - GCH 605 - Social Epidemiology Credits: 3
  - GCH 752 - Nutritional Epidemiology Credits: 3
  - GCH 762 - Environmental Epidemiology Credits: 3
  - GGS 540 - Medical Geography Credits: 3
Elective: 3 credits as approved by advisor

All electives must be approved by advisor prior to the start of the course.

▲ Global and Community Health Concentration (GCH): 18 Credits

The global and community health concentration emphasizes health education and behavior approaches to addressing health problems in domestic and international settings. Students become familiar with a wide range of health topics that extend across borders, including infectious disease, nutrition, environmental health, social and cultural health ecology, and health policy and management. Through coursework and opportunities for practical application, students will learn to develop, implement, manage, and evaluate health promotion and disease prevention strategies.

Global and Community Health Concentration Requirements:

- GCH 610 - Health Behavior Theory Credits: 3
- GCH 611 - Health Program Planning and Evaluation Credits: 3
- GCH 651 - Behavioral Research Methods Credits: 3

Choose one of the following courses:

- GCH 640 - Global Infectious Diseases Credits: 3
- NUTR 630 - Global Nutrition Credits: 3

Electives: 6 credits as approved by advisor

All electives must be approved by advisor prior to the start of the course.

Total: 42 credits

Master's Level Certificate

Biostatistics Graduate Certificate

Banner Code: HH-CERG-BSTN

Unit: Global and Community Health

This 15-credit certificate prepares participants to use statistical methods to analyze health care data. It is designed for health scientists and professionals in health-related government agencies, pharmaceutical companies, research hospitals, public health agencies, and other medical research organizations who design medical experiments and analyze and interpret complex health data. In addition, the program helps prepare students to begin careers in such organizations.
Application Requirements

Applicants must hold a bachelor’s degree in a discipline related to health science or statistics, such as medicine, biology, nursing, health science, biostatistics, statistics, mathematics, and psychology. A course in statistics and a course in college algebra with a grade of B or higher are required for admission to the program.

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

The graduate certificate in biostatistics may be pursued only on a part-time basis.

Certificate Requirements

Students must complete five courses for a total of 15 credits. A minimum of 6 credits must be taken through the Department of Global and Community Health.

Candidates must have a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses:

- GCH 712 - Introduction to Epidemiology Credits: 3
- STAT 560 - Biostatistical Methods Credits: 3

Choose one of the following two courses:

- STAT 535 - Analysis of Experimental Data Using SPSS Credits: 3
- STAT 554 - Applied Statistics Credits: 3

Choose one of the following courses:

- GCH 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3
- NURS 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3
- STAT 544 - Applied Probability Credits: 3

Choose one of the following courses:

- GCH 805 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3
- NURS 805 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3

or one 600 level course in statistics

Total: 15 credits

Epidemiology Graduate Certificate

Banner Code: HH-CERG-EPID
Unit: Global and Community Health

Epidemiology is the study of the factors that influence the occurrence, distribution, prevention, and control of disease. This certificate prepares students to apply the principles and methods of epidemiology to health research. The program emphasizes the development of skills such as study design, data collection and management, data analysis and interpretation, and communication of research findings. All students in the certificate program must complete introductory courses in epidemiology and biostatistics and then choose four elective courses in areas such as infectious disease epidemiology, chronic disease epidemiology, social epidemiology, and advanced epidemiological methods.

Admission Requirements

Course work in statistics, health science, biological science, and the social sciences are beneficial in preparation for this certificate. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

The graduate certificate in epidemiology may be pursued only on a part-time basis.

Certificate Requirements

Candidates must have 18 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C to earn the certificate.

Required Courses (6 credits)

- GCH 601 - Introduction to Biostatistics Credits: 3 (or an approved graduate-level statistics course)
- GCH 712 - Introduction to Epidemiology Credits: 3

Electives (select 12 credits from the following)

- GCH 605 - Social Epidemiology Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3
- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 726 - Advanced Methods in Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- GCH 752 - Nutritional Epidemiology Credits: 3
- GCH 762 - Environmental Epidemiology Credits: 3
- GGS 540 - Medical Geography Credits: 3

Total: 18 credits

Note:

Other epidemiology-related courses may count toward the certificate with prior approval of the program director.
Global Health Graduate Certificate

Banner Code:  HII-CERG-GLOH

Unit: Global and Community Health

This program develops an understanding of global health through a practicum, as well as a sequence of courses that includes global health, epidemiology, nutrition, anthropology, international relations, communications, and geography.

Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in global health may be pursued only on a part-time basis.

Certificate Requirements

Candidates must have 18 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (12 credits)

- GCH 543 - Global Health Credits: 3
- GCH 590 - International Health Organizations Credits: 3
- NUTR 630 - Global Nutrition Credits: 3
- GCH 780 - Practicum Seminar Credits: 0
- GCH 790 - Practicum in Public Health Credits: 3

Electives (select 6 credits from the following)

- RHBS 550 - Foundations of Rehabilitation Science Credits: 3
- GCH 560 - Environmental Health Credits: 3
- GCH 602 - Global Health Issues Related to Violence Credits: 3
- GCH 605 - Social Epidemiology Credits: 3
- GCH 610 - Health Behavior Theory Credits: 3
- RHBS 620 - Psychosocial Aspects of Rehabilitation Credits: 3
- GCH 640 - Global Infectious Diseases Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3
- NUTR 751 - Nutritional Assessment, Monitoring, and Surveillance Credits: 3
- GCH 752 - Nutritional Epidemiology Credits: 3
- ANTH 631 - Refugees in the Contemporary World Credits: 3
- COMM 637 - Risk Communication Credits: 3
Public Health Graduate Certificate

Banner code: HH-CERG-PUBH

Unit: Global and Community Health

The public health certificate will provide students with the fundamental skills and knowledge central to each of the five core areas of public health – social and behavioral health, epidemiology, biostatistics, environmental health, and health systems.

Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in public health may be pursued only on a part-time basis.

Certificate Requirements

A minimum GPA of 3.0 in the certificate courses is required for the certificate to be granted. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (15 credits)

- GCH 560 - Environmental Health Credits: 3
- GCH 601 - Introduction to Biostatistics Credits: 3
- GCH 610 - Health Behavior Theory Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3
  and
- GCH 590 - International Health Organizations Credits: 3
  or
- HAP 678 - Introduction to the U.S. Health System Credits: 3

Electives (3 credits)

Select one elective course from GCH or HAP in consultation with your Public Health certificate advisor.
Total: 18 credits

■ Health Administration and Policy

Phone: 703-993-1929
web: hap.gmu.edu/

Faculty

Professors: Hadley (associate dean for finance and planning), Kluger, Maddox (chair), Meiners, Nichols (Center for Health Policy Research and Ethics director)

Associate Professors: Eckenwiler, Cuellar, Giang, Gimm, Helmchen, Kitsantas, Perlin

Assistant Professors: Carle, Cantiello, Min, Nambisan, Wojtusiak, Yang

Instructors: Henderson, Shiver

Research Instructor: Debold

The mission of the Department of Health Administration and Policy (HAP) is to provide innovative education and research that contributes to improving health and human systems and the quality of life and health for those they serve across the life span. The Department prepares working professionals and those who aspire to careers in health systems and organizations to work as administrators, health technology officers, health informatics specialists, data security managers, and health policy analysts.

The research and scholarly activities of the department contribute to basic and applied knowledge about the organization, management, financing and performance of U.S. health systems and public health services; the development, adoption, use and management of health information systems; and the development and analysis of U.S. health policy to foster innovation and public accountability and contribute to ensuring access to cost-effective, high-quality health services. The Department works with stakeholders such as consumers, employer stakeholders, students, faculty, alumni, research funders, and state and federal agencies and advocacy organizations the community to ensure rigorous, relevant educational programs (including post-graduate professional development), professional and community service activities, and the development and timely dissemination of research. Part-time students are encouraged to take at least 6 credits per semester to promote timely completion of the program.

Undergraduate Degree

Health Administration, BS

Banner Code: HH-BS-HADM

Unit: Health Administration and Policy

The BS in health administration prepares students to become managers in a variety of settings, including hospitals; clinics; community health, home care, long-term care, and managed care organizations; physician practices; information technology, medical technology and supply organizations; advocacy organizations and professional associations; the insurance industry; and consultant services.
Concentrations are offered in health systems management, assisted living/senior housing administration, and health informatics. The concentration in health systems management prepares graduates to serve in entry-level management, administrative and support positions in a variety of health-related organizations and settings. The concentration in assisted living/senior housing administration prepares graduates to serve in entry-level administrator and support positions within independent living, assisted living, and continuing care retirement communities. The concentration in health informatics prepares graduates in theory and methods for using information processing methods in healthcare organizations.

The program may be completed on a full- or part-time basis leading to completion of the objectives of the undergraduate BS program. A criminal background check is required of all students prior to beginning their internship. A minimum grade of C must be obtained in all major requirements (52 - 55 credits).

Students must check with their advisor to ensure that all requirements have been met prior to graduation. HAP 498 is a competitive internship elective offered in the student’s final semester as described below.

Degree Requirements

General Education (38 credits)

Written Communication:

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3 (Business section recommended)
  Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.

Oral Communication:

Choose one of the following:

- COMM 100 - Public Speaking Credits: 3
- COMM 101 - Interpersonal and Group Interaction Credits: 3

Quantitative Reasoning:

- STAT 250 - Introductory Statistics I Credits: 3

Information Technology:

- IT 103 - Introduction to Computing Credits: 3

Literature:

- An approved University General Education literature course.
Arts:

- An approved University General Education arts course.

Natural Science:

- BIOL 103 - Introductory Biology I Credits: 4 and
- BIOL 104 - Introductory Biology II Credits: 4
- or
- BIOL 124 - Human Anatomy and Physiology Credits: 4 and
- BIOL 125 - Human Anatomy and Physiology Credits: 4

Western Civilization:

Choose one of the following:

- HIST 100 - History of Western Civilization Credits: 3
- HIST 125 - Introduction to World History Credits: 3

Global Understanding:

- An approved University General Education global understanding course.

Social Science:

- ECON 103 - Contemporary Microeconomic Principles Credits: 3

▲ Concentration in Assisted Living/Senior Housing Administration (ASHA)

Required Courses (12 credits)

- PSYC 100 - Basic Concepts in Psychology Credits: 3
- ACCT 203 - Survey of Accounting Credits: 3
- HAP 201 - Health Professions Careers Credits: 3
- HAP 202 - Medical Terminology Credits: 3

Major Requirements (55 credits)
• HAP 301 - Health Care Delivery in the United States Credits: 3
• GCH 300 - Introduction to Public Health Credits: 3
• HAP 307 - Assisted Living/Senior Housing Management and Philosophy Credits: 3
• HAP 310 - Healthcare Ethics Credits: 3
• HAP 312 - Healthcare Law Credits: 3
• HAP 360 - Introduction to Health Information Systems Credits: 3
• HAP 392 - Human Resources Management in Healthcare Credits: 3
• HAP 395 - Health Care Finance Credits: 3
• HAP 396 - Strategic Health Management and Planning Credits: 3
• HAP 416 - Leadership and Management of Health Systems I Credits: 3
• HAP 417 - Leadership and Management of Health Systems II Credits: 3
• HAP 425 - Health Economics and Policy Credits: 3
• HAP 465 - Integration of Professional Skills and Issues Credits: 3 (satisfies the university synthesis requirement)
• HAP 489 - Pre-Internship Seminar Credits: 1
• HAP 498 - Health Administration Internship Credits: 6
  Internship in assisted living and senior housing or hospitality services as approved by the program coordinator. Under special circumstances, students may be excused by the Department Chair from taking this course upon recommendation by the course instructor and the student's advisor.

Three of the following:
• GCH 480 - Health Maintenance and Health Aspects of Aging Credits: 3
• NURS 492 - Death, Dying, and Decision Making Credits: 3
• SOCW 435 - Introduction to Gerontology Credits: 3
• PSYC 415 - Psychological Factors in Aging Credits: 3
• EDIT 410 - Introduction to Assistive Technology Credits: 3

CHHS Electives (6 credits)

• 2 CHHS electives approved by the program coordinator.

General Electives (9 credits)

• Electives are at the student's discretion.

▲Concentration in Health Informatics (HINF)

Required Courses (12 credits)

• PSYC 100 - Basic Concepts in Psychology Credits: 3
• ACCT 203 - Survey of Accounting Credits: 3
• HAP 201 - Health Professions Careers Credits: 3
Major Requirements (52 credits)

- GCH 300 - Introduction to Public Health Credits: 3
- HAP 301 - Health Care Delivery in the United States Credits: 3
- HAP 310 - Healthcare Ethics Credits: 3
- HAP 312 - Healthcare Law Credits: 3
- HAP 360 - Introduction to Health Information Systems Credits: 3
- HAP 361 - Health Databases Credits: 3
- HAP 392 - Human Resources Management in Healthcare Credits: 3
- HAP 430 - Process Improvement in Healthcare Organizations Credits: 3
- HAP 445 - Introduction to Health Services Research Credits: 3
- HAP 459 - Health Data Standards Credits: 3
- HAP 460 - Information Technology Project Management Credits: 3
- HAP 461 - Internet and Web Technology Applications for Healthcare Credits: 3
- HAP 462 - Privacy and Security in Health Informatics Credits: 3
- HAP 465 - Integration of Professional Skills and Issues Credits: 3 (satisfies the university synthesis requirement)
- HAP 489 - Pre-Internship Seminar Credits: 1
- HAP 498 - Health Administration Internship Credits: 6

Under special circumstances, students may be excused by the Department Chair from taking this course upon recommendation by the course instructor and the student’s advisor.

One of the following:
- HAP 395 - Health Care Finance Credits: 3
- HAP 425 - Health Economics and Policy Credits: 3
- HAP 442 - Introduction to Health Care Politics and Policy Credits: 3

CHHS Electives (9 credits)

- 3 CHHS electives approved by the program coordinator.

General Electives (9 credits)

- Electives are at the student's discretion.

▲ Concentration in Health Systems Management (HSMG)

Required Courses (12 credits)
Major Requirements (55 credits)

- GCH 300 - Introduction to Public Health Credits: 3
- HAP 301 - Health Care Delivery in the United States Credits: 3
- HAP 310 - Healthcare Ethics Credits: 3
- HAP 312 - Healthcare Law Credits: 3
- HAP 360 - Introduction to Health Information Systems Credits: 3
- HAP 392 - Human Resources Management in Healthcare Credits: 3
- HAP 395 - Health Care Finance Credits: 3
- HAP 396 - Strategic Health Management and Planning Credits: 3
- HAP 410 - Introduction to Health/Medical Practice Management Credits: 3
- HAP 416 - Leadership and Management of Health Systems I Credits: 3
- HAP 417 - Leadership and Management of Health Systems II Credits: 3
- HAP 425 - Health Economics and Policy Credits: 3
- HAP 430 - Process Improvement in Healthcare Organizations Credits: 3
- HAP 442 - Introduction to Health Care Politics and Policy Credits: 3
- HAP 445 - Introduction to Health Services Research Credits: 3
- HAP 465 - Integration of Professional Skills and Issues Credits: 3 (satisfies the university synthesis requirement)
- HAP 489 - Pre-Internship Seminar Credits: 1
- HAP 498 - Health Administration Internship Credits: 6
  Under special circumstances, students may be excused by the Department Chair from taking this course upon recommendation by the course instructor and the student’s advisor.

CHHS Electives (6 credits)

- 2 CHHS electives approved by the program coordinator.

General Electives (9 credits)

- Electives are at the student’s discretion.

Total: 120 credits

Undergraduate Minor
Health and Social Policy Minor

Banner code: HSP

Unit: Health Administration and Policy and Social Work

The minor in Health and Social Policy introduces students to the context and process for public policymaking in health care and social services. Students will examine the current environment for health and social policy, learn the basic elements of the public policymaking process, and apply this knowledge in a practical research endeavor. This minor is a joint program offered by the Department of Health Administration and Policy and the Department of Social Work.

Minor Requirements (18 credits)

Students should be familiar with university-wide requirements for minors described in the Undergraduate Policies section of the Academic Policies chapter of this catalog.

Students pursuing this minor must complete 18 credits as follows:

Students will take four (5) core and one (1) elective course (in an area of health and social policy interest). The final core course is the Research Internship, taken after completion of the other course requirements for the minor. In the internship course, the student will work as a member of a research team under the direction/mentorship of a faculty researcher.

Required Courses (15 credits)

- HAP 301 - Health Care Delivery in the United States Credits: 3
- HAP 442 - Introduction to Health Care Politics and Policy Credits: 3
- GCH 445 or SOCW 445 - Social Determinants of Health Credits: 3
- HAP 445 - Introduction to Health Services Research Credits: 3 or SOCW 471 - Research in Social Work Credits: 3
- SOCW 480 or HAP 480 - Research Internship in Health and Human Services Credits: 3

SOCW/HAP 480 is taken as a capstone course after all other courses in the minor have been completed.

A minor in Health and Social Policy requires a dedicated internship (HAP/SOCW 480) that may only be applied toward this minor or CHHS program of study. The research internship will be focused on research in an area of applied health or social policy. The practicum experience will be supervised by a course faculty member, under the direction of a faculty mentor from the Department of Health Administration and Policy or Department of Social Work engaged in research.

Special course pre-registration procedures must be completed prior to registering for this course. As part of this process, the student’s research practicum and faculty assignment must be approved in writing, prior to registration, by his/her CHHS faculty advisor.

Electives (3 credits)

Select one of the following:

- HAP 290 - Lifestyle Management through Systems Analysis Credits: 3
- HAP 310 - Healthcare Ethics Credits: 3
Health Information Technology Minor

Banner code: HIT

Unit: Health Administration and Policy

The minor in Health Information Technology introduces students, in a non-technical context, to the utilization of health information management in the professional arena of healthcare management and policy. Students will examine the current and projected role of health information management in the delivery of healthcare and development of health policy and apply this information in a practical research endeavor.

Minor Requirements

A minor in Health Information Technology requires a minimum of 18 credits, at least 12 of which must be applied only to the minor and cannot be used to fulfill the program of study requirements of the student’s major, concentration, undergraduate certificate, or another minor. Students should be familiar with university-wide requirements for minors described in the Undergraduate Policies section of the Academic Policies chapter of this catalog.

Required Courses (12 credits)

- HAP 301 - Health Care Delivery in the United States Credits: 3
- HAP 360 - Introduction to Health Information Systems Credits: 3
- HAP 361 - Health Databases Credits: 3
- HAP 459 - Health Data Standards Credits: 3

Elective Course (3 credits)

Select one of two courses:

- HAP 445 - Introduction to Health Services Research Credits: 3
- HAP 460 - Information Technology Project Management Credits: 3
**Research Internship (3 credits)**

- **HAP 480 - Research Internship in Health and Human Services**
  Credits: 3

  A minor in Health Information Technology requires a dedicated internship (HAP 480) that may only be applied toward this minor or CHHS program of study. The research internship will be focused on research in an area of applied health informatics. The practicum experience will be supervised by a course faculty member, under the direction of a faculty mentor from the Department of Health Administration and Policy engaged in research.

  Special course pre-registration procedures must be completed prior to registering for this course. As part of this process, the student’s research practicum and faculty assignment must be approved in writing, prior to registration, by his/her CHHS faculty advisor.

**Total: 18 credits**

**Master's Degree**

**Health and Medical Policy, MS (CHHS)**

**Banner code: HH-MS-HMP**

**Unit: Health Administration and Policy**

The master’s program in health and medical policy is offered jointly by the College of Health and Human Services and the School of Public Policy. It prepares students to become health and medical systems policy analysts, consultants, and public health advocates in the US and internationally. It provides students with the knowledge, skills and abilities needed for improved national/international health systems planning and decision-making and to support policy formulation, resource allocation, and advocacy for health and medical professionals and health systems. Students applying to the program will be admitted to one of two concentrations: Health Policy or Global Medical Policy.

The Health Policy concentration provides students with humanistic and analytic skills necessary to propose, design, implement and analyze pragmatic policy-centric solutions to a myriad of complex domestic social and health system problems.

**Admission Requirements**

*The following requirements are for students applying to the Health Policy concentration.*

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database. Submission of GRE or GMAT scores is not required except for the School of Public Policy students seeking merit-based scholarships.

**Transfer of Credit**
Students may transfer a maximum of 12 credits into the Health Policy concentration from graduate courses taken at other institutions or taken at Mason in nondegree status. Transfer credit is subject to university and college policies and must be approved by the program director and the dean. Students who enroll initially through nondegree studies should seek course advising through the department and should submit their application to the MS program in their first semester of study.

Degree Requirements

Students complete 42 hours of course work through a combination of core courses and concentration courses.

Core Courses (21 credits)

Health and Medical Systems (6 credits)

- HAP 609 - Comparative International Health Systems Credits: 3
- HAP 715 - Health Economics Credits: 3

Public Policy Process (6 credits)

- PUBP 700 - Theory and Practice in Public Policy Credits: 3
- PUBP 730 - US National Policy Systems and Theory Credits: 3

Policy Analysis (9 credits)

- HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3 or PUBP 704 - Statistical Methods in Policy Analysis Credits: 3
- HAP 730 - Health Care Decision Analysis Credits: 3 or PUBP 713 - Policy and Program Evaluation Credits: 3
- HAP 645 - Introduction to Health Services Research Credits: 3 or PUBP 710 - Topics in Public Policy Credits: 1-3

▲ Concentration in Health Policy (HTHP)

Required Courses (15 credits)

- HAP 642 - Health Policy Development and Analysis Credits: 3
- HAP 750 - Legal Issues in Health Administration Credits: 3
Health Informatics, MS

Banner code: HH-MS-HINF

Unit: Health Administration and Policy

The Master of Science in Health Informatics is offered through the Department of Health Administration and Policy in the College of Health and Human Services, in collaboration with the Applied Information Technology Program in the Volgenau School of Engineering. Students obtaining this degree will have had the required experience and receive the highly specialized knowledge and skills needed to support the adoption and use of health information systems and analytic applications for a variety of clinical, administrative, and research purposes.

This 34-credit graduate degree program prepares students to become health information systems specialists, managers and consultants. Graduates of the program may be employed in health information technology firms, health care/service organizations and their business partners, as well as public health entities. Graduates are able to effectively manage evolving health information systems (ranging from evaluation of information needs to design, development, acquisition, implementation, operation and improvement) and support the increased adoption and use of electronic health records. Also, students are familiarized with the newest trends and emerging technologies likely to impact the field in the future.

Admission Requirements

Applicants must hold a BA or BS degree or equivalent from an accredited university or college. Although the field or major is not a criterion for admission, the applicants are expected to have taken basic-level computer science/technology, mathematics, and statistics. An undergraduate grade point average of 3.25 (on a 4.0 scale) or above is preferred.

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

Furthermore, applicants with at least 1 year of professional work experience in a medical or health-related organization OR 1 year of work experience in information technology in any sector are preferred. The decision for admission will be based upon several factors that may indicate an applicant’s potential for success in graduate studies. Important among them are the undergraduate GPA and work experience.

Transfer of Credit
Students may transfer a maximum of 12 credits into the MS in Health Informatics program from graduate courses taken at other institutions or taken at Mason in nondegree status. Transfer credit is subject to university and college policies and must be approved by the program director and the dean. Students who enroll initially through nondegree studies should seek course advising through the department and should submit their application to the MS program in their first semester of study.

Degree Requirements

The 34-credit curriculum contains eight (8) required core courses and four (4) elective courses selected from four content areas: Leadership and IT Management (Group I), Statistics and Research Methods (Group II), Healthcare Decision Support (Group III), and Policy and Regulatory Conformance (Group IV). Students choose one elective course from each of these four content groups. Because students are admitted to the program from a variety of backgrounds, the curriculum is designed to be flexible to meet individual student learning needs.

Core Courses (22 credits)

- HAP 678 - Introduction to the U.S. Health System Credits: 3
- HAP 700 - Introduction to Health Informatics Credits: 3
- HAP 701 - Health Data: Vocabulary and Standards Credits: 3
- HAP 709 - Health Care Databases Credits: 3
- INFS 622 - Information Systems Analysis and Design Credits: 3
- HAP 752 - Advanced Health Information Systems Credits: 3
- HAP 789 - Pre-Practicum Seminar Credits: 1
- HAP 790 - Capstone Practicum in Health Systems Management Credits: 3

Electives (12 credits)

Students will select one course from each of the following four groups:

**Leadership and IT Management (Group I):**
- HAP 713 - Project Management in Health Information Technology Credits: 3
- SWE 620 - Software Requirements Analysis and Specification Credits: 3
- SWE 625 - Software Project Management Credits: 3
- HAP 601 - E-Commerce and On-line Marketing for Health Services Credits: 3

**Statistics and Research Methods (Group II):**
- HAP 602 - Statistics in Health Services Management Credits: 3
- HAP 820 - Analytic Models in Health Services Management, Policy, and Research Credits: 3
- HHS 597 - Approaches to Quantitative Data Analysis in Health Care Research Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- HAP 720 - Health Data Integration Credits: 3

**Healthcare Decision Support (Group III):**
- HAP 730 - Health Care Decision Analysis Credits: 3
- HAP 745 - Health Care Security Policy Credits: 3
Health Systems Management, MHA

Banner Code:  HHH-MHA-HSMG

Unit: Health Administration and Policy

The Master of Health Administration (MHA) in Health Systems Management program prepares students with the knowledge and skills to work as leaders and executive-level managers in evolving health systems, or consultants and managers of health information systems. The curriculum was developed in response to the demand for advanced health management preparation for a variety of healthcare and allied health professionals to be employed in health-related organizations (hospitals, consulting and regulatory entities, medical practice groups, ambulatory clinics, managed care organizations, government agencies, information systems departments) in both the public and private sectors of healthcare. Concentrations are offered in: executive management, health information systems, health care security and privacy, physician practice management, and risk management and patient safety.

The program of study offers state-of-the-art technical and humanistic skills so that graduates may serve as leaders, managers, and consultants in various settings. The curriculum integrates concepts from a variety of disciplines such as business management, economics, finance, philosophy, organizational behavior, marketing, information technology, social psychology, public policy, law, and ethics as they apply to the administration of healthcare organizations.

The interdisciplinary curriculum is designed to prepare graduates with an understanding of the larger sociopolitical, global health, and economic contexts in which the U.S. health system operates. It provides working professionals with leadership knowledge and managerial skills and abilities that contribute to improving the efficiency and effectiveness of health systems and alignment of decisions and resources to optimize organizational and health-related public policy goals. Students examine social imperatives for access to health services and the feasibility, need, and mechanisms of market factors. They create links and alignment between public and private sectors and among voluntary, market, and regulatory forces in the context of a variety of public policy frameworks. Students explore the design and management of seamless systems of care, information technology, and services that support the providers of health-related care and services over the life span. Using ethical principles, students explore approaches to improving access to care and services and the quality and safety of health systems and their integration to maximize quality of life and community health.

Admission Requirements
Health care professionals with a baccalaureate degree and one to three years of recent experience in health or a related management or technology field are eligible to apply. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

Transfer of Credit

Students may transfer a maximum of 12 credits into the Master in Health Administration program from graduate courses taken at other institutions or taken at Mason in nondegree status. Transfer credit is subject to university and college policies and must be approved by the program director and the dean. Students who enroll initially through nondegree studies should seek course advising through the department and should submit their application to the Master in Health Administration program in their first semester of study.

Program Format

The program schedule is geared toward working professionals. The usual schedule for students involves part-time study, comprising two classes (6 credits) per semester. Classes are held primarily in evenings, with some Saturday daytime classes. Selected courses also are available via the Internet.

Degree Requirements

The program of study comprises 43 credits: 28 credits from the common core of the degree and another 15 from one of the concentrations.

Core Courses (28 credits)

- HAP 602 - Statistics in Health Services Management Credits: 3
- HAP 686 - Quality Improvement in Health Services Credits: 3
- HAP 645 - Introduction to Health Services Research Credits: 3
- HAP 621 - Management of Health Service Organizations Credits: 3
- HAP 678 - Introduction to the U.S. Health System Credits: 3
- HAP 715 - Health Economics Credits: 3
- HAP 740 - Management of Health Information Systems Credits: 3
- HAP 750 - Legal Issues in Health Administration Credits: 3
- HAP 789 - Pre-Practicum Seminar Credits: 1
- HAP 790 - Capstone Practicum in Health Systems Management Credits: 3

▲ Concentration in Executive Management (EMGT)

The mission of the Master in Health Administration program (MHA) in Health Systems Management, Concentration in Executive Management, is to provide experienced students with the knowledge and skills to work as leaders and executive-level managers in evolving health systems. The curriculum prepares graduates with competencies to work effectively in mid- and executive-level management in a variety of roles located in health-related organizations (hospitals, consulting, and regulatory entities, medical practice groups, ambulatory clinics and managed care organizations) in public or private health sectors.
Required Courses (15 credits)

- HAP 702 - Managerial Accounting in Health Care Credits: 3
- HAP 703 - Financial Management in Health Systems Credits: 3
- HAP 704 - Contemporary Issues in Health Systems Management Credits: 3
- HAP 705 - Strategic Management and Marketing in Health Care Credits: 3
- HAP 706 - Integrated Health Systems Management Credits: 3

Total: 15 credits

▲ Concentration in Health Care Security and Privacy (HCSP)

Required Courses (12 Credits)

- HAP 735 - Risk Analysis in Health and Bioscience Credits: 3
- HAP 612 - Maintaining Business Continuity in Health Care Credits: 3
- HAP 745 - Health Care Security Policy Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3

Elective (3 Credits)

Advisor-approved elective related to health care data or information systems security or policy

Total: 15 credits

▲ Concentration in Health Information Systems (HISN)

Required Courses (12 credits)

- HAP 701 - Health Data: Vocabulary and Standards Credits: 3
- HAP 709 - Health Care Databases Credits: 3
- HAP 745 - Health Care Security Policy Credits: 3
- HAP 752 - Advanced Health Information Systems Credits: 3

Electives (3 credits)

- Advisor-approved elective: Credits: 3
Total: 15 credits

▲ Concentration in Physician Practice Management (PPM)

Required Courses (15 credits)

- HAP 610 - Health/Medical Practice Management Credits: 3
- HAP 652 - Essentials of Health Insurance and Managed Care Credits: 3
- HAP 703 - Financial Management in Health Systems Credits: 3
- HAP 704 - Contemporary Issues in Health Systems Management Credits: 3
- HAP 705 - Strategic Management and Marketing in Health Care Credits: 3

Total: 15 credits

▲ Concentration in Risk Management and Patient Safety (RMPS)

Required Courses (12 credits)

- HAP 647 - Regulatory Requirements for Health Care Systems Credits: 3
- HAP 730 - Health Care Decision Analysis Credits: 3
- HAP 735 - Risk Analysis in Health and Bioscience Credits: 3
  (Students may also meet this requirement by taking courses in the Epidemiology and Biostatistics Program within the Department of Global and Community Health)
- HAP 762 - Cost-Effectiveness for Health Care Management and Policy Decisions Credits: 3

Elective (select 3 credits from the following)

- HAP 642 - Health Policy Development and Analysis Credits: 3
- HAP 690 - Independent Study Credits: 1-3
- HAP 709 - Health Care Databases Credits: 3
- HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3
- HAP 720 - Health Data Integration Credits: 3
  Others as approved by advisor.
Master’s International

The Master of Health Administration in Health Systems Management program at George Mason University participates in the Peace Corps Master’s International (MI) program. For students enrolled in the Health Systems Management MHA degree program and in the Peace Corp/MI program, the Office of the Provost will provide funding for 6 credits upon the student’s return from their volunteer service. In order for the tuition support to be applied, a representative from the graduate degree program must provide proof of volunteer service completion for the student.

Students apply separately, but at the same time, to the Peace Corps and to Mason. Students are special registered at Mason for the four semesters they are serving in the Peace Corps and participate remotely in classroom activities, working on an agreed-upon project and sharing experiences with HAP students and faculty. Students return to Mason after their two years of service to complete the remaining coursework required for the program.

Students must apply and be admitted to the Master of Health Administration in Health Systems Management program using the standard online Application for Graduate Admissions and are encouraged to apply simultaneously to the Peace Corps. Once admitted to the MHA program, and offered a Peace Corps assignment, students should contact the Chair of the Department of Health Administration and Policy to discuss a program plan. Students admitted to the master’s program but waiting for notification of acceptance from the Peace Corps may begin their master’s program but will not be eligible for a tuition grant until they have been accepted into the Peace Corps and have returned from their volunteer service. For more information about the Master’s International program, visit their website at www.peacecorps.gov/index.cfm?shell=learn.whyvol.eduben.mastersint.partschool.

Senior Housing Administration, MS

Banner code: HH-MS-SHA

Unit: Health Administration and Policy

The Master of Science in Senior Housing Administration is the nation’s first stand-alone degree to train executives in the day-to-day administration of active adult, assisted living, continuing care retirement, and related senior housing communities. Multidisciplinary course work enables students to evaluate, analyze, and synthesize information relative to the aging population, the evolution of senior housing services within the U.S. health system, regulatory and policy issues, and the application of hospitality, healthcare, and housing management practices to these services. An additional focus is on social, biological, and psychological aspects of healthy aging, and factors that promote quality of life and independence for seniors with special needs (i.e., memory issues and dementia). Electives within the degree allow individuals with limited healthcare, senior housing, or business management experience to focus on the area that will most enhance overall skills. A capstone practicum is required, during which students complete designated course work combined with on-site experience within a host senior housing community, association, or related organization.

Admission Requirements
Professionals with a baccalaureate degree and three years of recent experience in health care, business administration, hospitality management, aging services, or related long-term care services are preferred. Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

**Transfer of Credit**

Students may transfer a maximum of 12 credits into the MS in Senior Housing Administration program from graduate courses taken at other institutions or taken at Mason in nondegree status. Transfer credit is subject to university and college policies and must be approved by the program director and the dean. Students who enroll initially through nondegree studies should seek course advising through the department and should submit their application to the MS program in their first semester of study.

**Program Format**

The program schedule is geared toward working professionals. The usual schedule for students involves part-time study, comprising two classes (6 credits) per semester. Classes are held primarily in evenings, with some Saturday daytime classes. Selected courses also are available via the Internet.

**Degree Requirements**

The program of study comprises 37-40 credit hours: 28-31 credits from the common core of the degree and 9 credits of elective courses.

**Required Courses (28-31 credits)**

- HAP 678 - Introduction to the U.S. Health System Credits: 3
  HAP 678 is a prerequisite course. It may be waived for individuals with a minimum of three years healthcare/senior housing experience.
- GSOM 540 - Analysis of Financial Decisions Credits: 3
- PSYC 614 - The Psychology of Aging Credits: 3
- HAP 621 - Management of Health Service Organizations Credits: 3
- HAP 650 - Senior Housing Management and Operations Credits: 3
- HAP 651 - Senior Housing Sales and Marketing Credits: 3
- HAP 662 - Health Policy for Elders and People with Disabilities Credits: 3
- HAP 705 - Strategic Management and Marketing in Health Care Credits: 3
- HAP 750 - Legal Issues in Health Administration Credits: 3
- HAP 789 - Pre-Practicum Seminar Credits: 1
- HAP 790 - Capstone Practicum in Health Systems Management Credits: 3

**Electives (9 credits)**

Choose any three courses

**Management Focus**
Recommended for individuals with limited or no previous business management experience

- INFS 524 - Database Management Essentials Credits: 3
- COMM 601 - Communication in Professional Relationships Credits: 3
- COMM 635 - Organizational Communication Credits: 3

Healthcare Focus

Recommended for individuals with limited or no previous healthcare/senior housing experience

- PHIL 642 - Biomedical Ethics Credits: 3 or HAP 511 - Ethics in Public Health Credits: 3
- EDSE 510 - Introduction to Assistive Technology Credits: 3
- PRLS 503 - Administration and Disability Rights in Therapeutic Recreation Credits: 3
- PSYC 518 - Death, Dying, and Grieving Credits: 3
- RHBS 550 - Foundations of Rehabilitation Science Credits: 3

Health Administrative Focus

Recommended for individuals seeking to enhance/add coursework in general healthcare administration.

- HAP 602 - Statistics in Health Services Management Credits: 3
- HAP 686 - Quality Improvement in Health Services Credits: 3
- HAP 715 - Health Economics Credits: 3
- HAP 740 - Management of Health Information Systems Credits: 3

Total: 37-40 credits

Master's Level Certificate

Health Information Systems Graduate Certificate

Banner Code: HII-CERG-HISN

Unit: Health Administration and Policy

This certificate prepares clinicians and health care managers to develop and manage health information technology (IT) and systems. Students learn the theory, development, management, adoption, and use of information systems in clinical, administrative, and financial healthcare settings. Certificate coursework stresses the impact of technology on outcomes and quality of healthcare services. The certificate is ideal for individuals who want to learn foundations of information systems, basic technical skills including database design and management, healthcare data integration and exchange, and management of health information systems. It is also suitable for IT professionals who are new to the healthcare community.

Admission Requirements
Applicants must have a bachelor’s degree. No prior computer programming training is needed, although proficiency in utilization of computer systems is expected. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in health information systems may be pursued only on a part-time basis.

Certificate Requirements

Completion of the certificate requires 15 graduate credits. Students must complete all courses with a minimum GPA of 3.00. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (15 credits)

- For students with information technology/computer science background: HAP 678 - Introduction to the U.S. Health System Credits: 3
- For students with health care background: HAP 709 - Health Care Databases Credits: 3
- HAP 700 - Introduction to Health Informatics Credits: 3 or HAP 740 - Management of Health Information Systems Credits: 3
- HAP 701 - Health Data: Vocabulary and Standards Credits: 3
- HAP 745 - Health Care Security Policy Credits: 3
- HAP 752 - Advanced Health Information Systems Credits: 3

Total: 15 credits

Health Policy Graduate Certificate

Banner Code: HHH-CERG-HTHP

Unit: Health Administration and Policy

In an era of limited resources, rising health costs, eroding insurance coverage, and growing disparities in health care quality and access, this certificate provides students with analytic skills and knowledge necessary for evidence-based health policy planning, formulation, analysis, evaluation, and practice. Students will gain a working understanding of public policy processes, analysis and statistical methods, economics, health policy process/entities, strategic thinking, the politics of health policy-making, as well as public advocacy and communications skills. The certificate is ideal for clinicians and health care professionals who seek value-added career enhancement in health policy formulation, analysis and advocacy.

Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are
considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in health policy may be pursued only on a part-time basis.

Certificate Requirements

Completion of the certificate requires 15 graduate credits. Students must complete all courses with a minimum GPA of 3.00. Students deemed to have inadequate health care experience must successfully complete HAP 678 (Introduction to the U.S. Health System) prior to matriculation. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (15 credits)

- HAP 642 - Health Policy Development and Analysis Credits: 3
- HAP 645 - Introduction to Health Services Research Credits: 3
- HAP 715 - Health Economics Credits: 3
- HAP 762 - Cost-Effectiveness for Health Care Management and Policy Decisions Credits: 3

Choose one of the following:

- HAP 652 - Essentials of Health Insurance and Managed Care Credits: 3
- HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3
- HAP 730 - Health Care Decision Analysis Credits: 3
- HAP 764 - Health Policy and Government Payment Systems for Health Care Services Credits: 3

Total: 15 credits

Physician Practice Management Graduate Certificate

Banner code: HH-CERG-PPM

Unit: Health Administration and Policy

The purpose of this graduate certificate is to provide professionals with the knowledge, skills and ability to successfully establish and manage a contemporary medical practice/clinic enterprise. The curriculum builds upon established standards promulgated by the Medical Group Management Association for Medical Practice Management Certification. These include proficiency in financial management, operations management, human resources management, risk management, and planning and marketing. Upon completion of this certificate, graduates will be prepared didactically to take the Certified Medical Practice Executive examination.

Admissions Requirements

Health care professionals or administrative professionals with a baccalaureate degree and ideally three years of experience in a health or related management, public policy, or technology field are eligible to apply. Applicants must submit the following: 1)
transcripts from all previous college-level studies, 2) letter of interest specifying study goals, 3) curriculum vita, and 4) graduate admissions application.

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in physician practice management may be pursued only on a part-time basis.

Certificate Requirements

The Physician Practice Management Graduate Certificate requires a minimum of 15 credits. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (15 credits)

- HAP 610 - Health/Medical Practice Management Credits: 3
- HAP 652 - Essentials of Health Insurance and Managed Care Credits: 3
- HAP 703 - Financial Management in Health Systems Credits: 3
- HAP 704 - Contemporary Issues in Health Systems Management Credits: 3
- HAP 705 - Strategic Management and Marketing in Health Care Credits: 3

Additional Coursework

HAP 678 is required for students who do not have recent, relevant work experience in the U.S. health system. If HAP 678 is required, the total credit requirement increases to 18.

- HAP 678 - Introduction to the U.S. Health System Credits: 3

Total: 15-18 credits

Public Health Leadership and Management Graduate Certificate

Banner Code: HH-CERG-PHLM

Unit: Health Administration and Policy

This certificate prepares students to apply the principles of public health leadership, stewardship and policy implementation to manage state and local health departments and various non-profit organizational and community health program initiatives. Courses explain leadership strategy, public health regulatory requirements, public program management tools and policy development skills necessary to function in public health systems in the United States. The certificate is ideal for clinicians and health care professionals who seek value-added career enhancement in public health programs and entities.
Admission Requirements

Applicants must have a bachelor’s degree with a minimum GPA of 3.00 and knowledge of the health care system. Applicants are preferred who are a current student in a graduate degree program, have an earned masters degree, or have at least one year of experience in a health related role or entity. No prior experience in public health administration or policy is needed. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in public health leadership and management may be pursued only on a part-time basis.

Certificate Requirements

Completion of the certificate requires 18 graduate credits. Students must complete all courses with a minimum GPA of 3.00. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (15 credits)

- GCH 712 - Introduction to Epidemiology Credits: 3
- HAP 642 - Health Policy Development and Analysis Credits: 3
- HAP 680 - Applied Public Health Leadership and Management Credits: 3
- HAP 715 - Health Economics Credits: 3
- PUAD 661 - Public Budgeting Systems Credits: 3

Elective Course (3 credits)

Choose ONE (1) of the following courses or another course approved by advisor:

- HAP 511 - Ethics in Public Health Credits: 3
- HAP 540 - Introduction to Emergency Preparedness/Disaster Recovery for Health Care Professionals Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3
- HAP 632 - Grants Funding and Development Credits: 3
- HAP 661 - Policy Development and Analysis for Community Health Programs Credits: 3
- HAP 705 - Strategic Management and Marketing in Health Care Credits: 3
- HAP 740 - Management of Health Information Systems Credits: 3
- HAP 750 - Legal Issues in Health Administration Credits: 3
- HAP 762 - Cost-Effectiveness for Health Care Management and Policy Decisions Credits: 3
- HAP 764 - Health Policy and Government Payment Systems for Health Care Services Credits: 3
- PUBP 758 - Global Threats and Medical Policies Credits: 3

Total: 18 credits
Quality Improvement and Outcomes Management in Health Care Systems Graduate Certificate

Banner Code: HH-CERG-QIOM

Unit: Health Administration and Policy

This certificate prepares working clinicians and administrative support staff in health care organizations to implement quality-improvement initiatives and manage populations of patients to optimize efficiency and effectiveness of care and services. Participants acquire the knowledge and ability to work in interdisciplinary health care teams using the tools and techniques of statistical process control, and selected methods and tools from operations research and quality improvement. In addition, they use information management technology and qualitative decision-making applications to identify opportunities for clinical and administrative improvement, support decision making optimization, and improve health-service outcomes for identified populations.

Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in quality improvement and outcomes management in health care systems may be pursued only on a part-time basis.

Certificate Requirements

Candidates must have 15-18 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C, to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (12 credits)

- HAP 647 - Regulatory Requirements for Health Care Systems Credits: 3
- HAP 686 - Quality Improvement in Health Services Credits: 3
- HAP 730 - Health Care Decision Analysis Credits: 3

Choose one of the following:

- GCH 601 - Introduction to Biostatistics Credits: 3
- HAP 602 - Statistics in Health Services Management Credits: 3
- HHS 597 - Approaches to Quantitative Data Analysis in Health Care Research Credits: 3
- SOCW 671 - Research Methods for Social Workers Credits: 3

Elective (3 credits)

Choose one course from the following:

- HAP 709 - Health Care Databases Credits: 3
• HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3
• HAP 715 - Health Economics Credits: 3
• HAP 720 - Health Data Integration Credits: 3
• HAP 740 - Management of Health Information Systems Credits: 3
• SOCW 688 - Advanced Research in Social Work Credits: 3

Additional Coursework Required

A course in basic computer skills (credit or noncredit) and HAP 678 (mandatory for students without recent working experience in the U.S. health system) are considered optional for students who already possess the requisite knowledge and skills. They are required of those who do not. Decisions about this requirement are made by the department at the time of admission.

• HAP 678 - Introduction to the U.S. Health System Credits: 3

Total: 15-18 credits

Senior Housing Administration Graduate Certificate

Banner Code: HH-CERG-SHA

Unit: Health Administration and Policy

This 15 to 18-credit certificate provides multidisciplinary instruction in the administration and management of active adult, assisted living, continuing care retirement, and related senior housing communities. Courses enable students to evaluate, analyze, and synthesize information relative to the aging population, the evolution of the senior housing services within the U.S. health system, regulatory and policy issues, and the application of executive-level hospitality, healthcare, and housing management practices to these services. An additional focus is on biological, psychological, and social aspects of healthy aging and factors that promote quality of life and independence for seniors, including those with special needs (i.e., memory issues and dementia).

Admission Requirements

Professionals with a baccalaureate degree and three years of recent experience in healthcare, business administration, hospitality management, aging services, or related long-term care services are preferred. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

The graduate certificate in senior housing administration may be pursued only on a part-time basis.

Certificate Requirements

Candidates must have 15-18 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C, to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.
Required Courses (15 credits)

- HAP 678 - Introduction to the U.S. Health System Credits: 3
  Students with a previous healthcare degree and/or a minimum of three years healthcare or senior housing experience may request to substitute another relevant course for HAP 678 as approved by the program advisor.
- PSYC 614 - The Psychology of Aging Credits: 3
- HAP 662 - Health Policy for Elders and People with Disabilities Credits: 3
- HAP 650 - Senior Housing Management and Operations Credits: 3
- HAP 651 - Senior Housing Sales and Marketing Credits: 3

Optional Course (3 credits)

- HAP 790 - Capstone Practicum in Health Systems Management Credits: 3

Total: 15-18 credits

Nutrition and Food Studies

Phone: 703-993-4628
web: nfs.gmu.edu

Faculty

Associate Professors: Pawloski (chair), Petrick

Assistant Professors: Gewa, Slavin

The Department of Nutrition and Food Studies (NUTR) is a department within the College of Health and Human Services (CHHS). The overarching mission of Nutrition and Food Studies is to inform students and the public about the role of food and nutrition in improving health and well-being among local and global populations through the integration of education, research and outreach. The educational mission is to provide undergraduate and graduate degrees and certificates in food and nutrition-related studies. The research mission is to promote, develop and support research programs that help define and address food and nutritional issues. The outreach mission is to increase the awareness of food and nutrition-related issues among local and global communities, support local and global food and nutrition initiatives, and enhance collaboration among individuals and organizations to improve nutrition and health-related outcomes. Part-time students are encouraged to take at least 6 credits per semester to promote timely completion of the program.

Bachelor's Level Certificate

Nutrition Undergraduate Certificate
This program offers a variety of courses in nutrition for future and present health care professionals, researchers, and others who are commonly faced with community-related nutrition issues. The program is intended to help health care professionals and others who would like to increase their knowledge in nutrition. This certificate is not equivalent to the registered dietitian license and does not provide a license to practice therapeutic nutrition.

The nutrition undergraduate certificate can be pursued on a full- or part-time basis.

Certificate Requirements

Applicants need not have a bachelor’s degree. Applications are encouraged from all areas of nursing and health sciences. Application is made through CHHS. The certificate requires 24 credits of undergraduate course work. Students should consult the Academic Policies section of this catalog for more information on the university-wide requirements for undergraduate certificates.

Required Courses (21 credits)

- GCH 360 - Health and Environment Credits: 3
- GCH 412 - Fundamentals of Epidemiology Credits: 3
- NUTR 295 - Nutrition for Health Professionals Credits: 3
- NUTR 420 - Strategies for Nutrition Education Credits: 3
- NUTR 421 - Community Nutrition Credits: 3
- NUTR 422 - Nutrition throughout the Life Cycle Credits: 3
- NUTR 423 - Nutrition and Chronic Illnesses Credits: 3

One Elective Course (3 credits) in General Nutrition

- CHEM 102 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 3
- CHEM 463 - General Biochemistry I Credits: 4
- GCH 205 - International Health Credits: 3
- GCH 411 - Health Program Planning Credits: 3
- NUTR 466 - Nutrition and Weight Management: Obesity, Anorexia, and Bulimia Credits: 3
- PSYC 231 - Social Psychology Credits: 3

Note:

*NUTR 466 may be substituted for either NUTR 420 or NUTR 421.

Total: 24 credits

Undergraduate Minor
Nutrition Minor

Banner Code:  NUTR

Unit: Nutrition and Food Studies

The minor in nutrition is intended to increase knowledge of nutrition issues. Students who may be interested in completing the minor include those pursuing degrees related to nutrition, health, and education. This minor is not equivalent to the registered dietitian license and does not provide a license to practice therapeutic nutrition.

Course Work

Students are required to take an introductory nutrition course such as GCH 295. To complete the minor, students are required to pass 15 credits of undergraduate course work. At least 6 credits must be completed at Mason, and no more than 3 credits of C- or D in the minor are accepted.

Students should consult the Academic Policies section of this catalog for more information on the university-wide requirements for minors.

Minor Requirements

Required Courses (12 credits)

- NUTR 420 - Strategies for Nutrition Education Credits: 3
- NUTR 421 - Community Nutrition Credits: 3
- NUTR 422 - Nutrition throughout the Life Cycle Credits: 3
- NUTR 423 - Nutrition and Chronic Illnesses Credits: 3

Elective course (3 credits)

Select one of the following:

- CHEM 102 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 3
- CHEM 463 - General Biochemistry I Credits: 4
- NUTR 466 - Nutrition and Weight Management: Obesity, Anorexia, and Bulimia Credits: 3
  
  NUTR 466 can be used to substitute for either NUTR 420 or NUTR 421.
- NUTR 583 - Biocultural Perspectives on Food and Nutrition Credits: 3
- GCH 412 - Fundamentals of Epidemiology Credits: 3
- GCH 360 - Health and Environment Credits: 3
- GCH 411 - Health Program Planning Credits: 3
- GCH 205 - International Health Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 211 - Developmental Psychology Credits: 3
Total: 15 credits

**Master's Level Certificate**

**Food Security Graduate Certificate**

Banner Code: HH-CERG-FSEC

Unit: Nutrition and Food Studies

The graduate certificate in food security provides knowledge and tools in the areas of nutrition, food studies, geography, and geoinformation science to prepare students for careers in food security and safety. The program includes courses in nutrition, food security, food safety, and GIS and remote sensing, and the program will give students insight into the determinants of food security in developing and industrialized countries, the roots of vulnerabilities of populations most at-risk, and programs involved in food security research and interventions worldwide.

**Admission Requirements**

Applicants must meet the admission standard and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

The graduate certificate in food security may be pursued on a part-time or full-time basis.

**Certificate Requirements**

Candidates must have 21 graduate credits and a minimum GPA of 3.00 in course work applied to the certificate, with no more than 3 credits with a grade of C to earn the certificate. Students should be familiar with the requirements for graduate certificates, which can be found in the Academic Policies section of the University Catalog.

**Required Courses (18 credits)**

- NUTR 608 - Perspectives on Food Security Credits: 3
- NUTR 611 - Food and Nutrition Security Policy Credits: 3
- NUTR 610 - Food Safety and Defense Credits: 3
- NUTR 751 - Nutritional Assessment, Monitoring, and Surveillance Credits: 3
- GGS 579 - Remote Sensing Credits: 3

- For students in nutrition programs: GGS 553 - Geographic Information System Credits: 3
- For students in geography programs: NUTR 630 - Global Nutrition Credits: 3

Students NOT in geography and nutrition programs may select one of GGS 553 - Geographic Information System or NUTR 630 - Global Nutrition
Elective Course (3 credits)

- GCH 560 - Environmental Health Credits: 3
- NUTR 630 - Global Nutrition Credits: 3
- BIOD 726 - Agroterrorism and Food Security Credits: 3
- GGS 581 - World Food and Population Credits: 3
  or other approved elective course.

Total: 21 credits

Nutrition Graduate Certificate

Banner Code: HH-CERG-NUTR

Unit: Nutrition and Food Studies

The graduate certificate in nutrition prepares students to apply nutrition principles and the latest scientific evidence and methods of nutrition to health practice and research among different populations. The program emphasizes understanding the role of nutrition in population health and well-being and the development of skills required in the practice, analysis, and interpretation of nutrition-related information and data among individuals and populations. Students will acquire competencies in the following areas: public health nutrition framework; assessment and monitoring; research design and methodology; and planning and evaluation of nutrition programs.

Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

The graduate certificate in nutrition may be pursued on a part-time or full-time basis.

Certificate Requirements

Undergraduate courses in natural sciences, nursing, health science, and sociology are helpful. A maximum of 3 credits in equivalent course work taken at another college or university can be applied toward the certificate.

Candidates must have 18 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (12 credits)
Elective Courses (6 credits)

Select two courses from the following:

- GCH 610 - Health Behavior Theory Credits: 3
- GCH 611 - Health Program Planning and Evaluation Credits: 3
- GCH 752 - Nutritional Epidemiology Credits: 3
- NUTR 583 - Biocultural Perspectives on Food and Nutrition Credits: 3

Total: 18 credits

Rehabilitation Science

Phone: 703-993-1950
web: rehabscience.gmu.edu

Faculty

Professors: Gerber (Center for the Study of Chronic Illness and Disability, director), Guccione (chair)

Associate Professors: Keyser

Assistant Professors: Weinstein

Instructor: Winter

The Department of Rehabilitation Science (RHBS) is a department within the College of Health and Human Services (CHHS). Rehabilitation Science is an interdisciplinary field of study that seeks to understand the relationships among chronic illness, function, and disability and how to improve the quality of life for those individuals who live with a chronic condition. This field draws its body of knowledge from multiple disciplines spanning the physiological, health, and social sciences in order to approach the individual who lives with or is at risk of disability as a complete person with a full appreciation of the biopsychosocial environment in which that person functions.

The internationally recognized faculty mentor students through active involvement in their own funded research programs. Upon graduation, students are prepared for professional careers in academic, government, and industrial research environments with the tools to develop their own lines of research in Rehabilitation Science. Part-time students are encouraged to take at least 6 credits per semester to promote timely completion of the program.

Master's Level Certificate
Clinical Trials Management Graduate Certificate

Banner code: HH-CERG-CTM

Unit: Rehabilitation Science

This certificate prepares students to function in multiple leadership roles in the development, implementation, coordination, and evaluation of clinical trials. Courses address research design, statistical methods, and protocol design as well as the ethical and regulatory requirements for conducting clinical trials, including human subject protection. The certificate is well-suited to the needs of health care professionals and individuals currently working in clinical research environments who seek career development and enhancement in clinical trials coordination and management.

Admission Requirements

Applicants must have a bachelor’s degree with a minimum GPA of 3.00. Preference will be given to those who are currently enrolled in a graduate degree program, have a master's degree, or have at least one year of experience in a health care or research-related role or entity. No prior experience in clinical trials is needed. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in clinical trials management may be pursued only on a part-time basis.

Certificate Requirements

Completion of the certificate requires 15 graduate credits. Students must complete all courses with a minimum GPA of 3.00, with no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (12 credits)

- RHBS 720 - Principles of Clinical Trials Credits: 3
- HAP 822 - Research Designs and Analysis in Pharmaceutical and Health-Related Clinical Trials Credits: 3

One of:
- GCH 601 - Introduction to Biostatistics Credits: 3
- NURS 757 - Nursing Research and Biostatistics I Credits: 3
- HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3

One of:
- HAP 700 - Introduction to Health Informatics Credits: 3
- NURS 715 - Nursing Informatics Inquiry Credits: 3

Elective Course (3 credits)
Choose one of the following courses or another course approved by advisor:

- GCH 611 - Health Program Planning and Evaluation Credits: 3
- GCH 691 - Project Management in Public Health Credits: 3
- HAP 632 - Grants Funding and Development Credits: 3
- HAP 647 - Regulatory Requirements for Health Care Systems Credits: 3
- HAP 709 - Health Care Databases Credits: 3
- HAP 714 - Ethical Issues in Health Administration and Policy Credits: 3
- HAP 720 - Health Data Integration Credits: 3
- HAP 762 - Cost-Effectiveness for Health Care Management and Policy Decisions Credits: 3
- NURS 761 - Pharmacotherapeutics Credits: 3
- NURS 957 - Ethics of Health Care Research Credits: 3
- PHIL 645 - Research Ethics Credits: 3
- RHBS 816 - Comparative Effectiveness Research Credits: 3

Total: 15 credits

Rehabilitation Science Graduate Certificate

Banner Code: HII-CERG-RHBS

Unit: Rehabilitation Science

The graduate certificate in rehabilitation science prepares students to apply research and statistical techniques to the study of the enabling–disabling process. The Institute of Medicine defines rehabilitation science as “a field of study that encompasses basic and applied aspects of the health sciences, social sciences, and engineering. It is the melding of knowledge from several disciplines to understand the fundamental nature of the enabling–disabling process.” Students will acquire competencies in the following areas: rehabilitation and recovery framework, research design and methodology, statistics, and conduct of applied rehabilitation research. The department hosts information sessions on a regular basis for those interested in our academic programs. Visit the college website for details.

Admission Requirements

Admission to this certificate requires a bachelor’s degree in a discipline related to health sciences from an accredited institution of higher education with a minimum GPA of 3.00 in the last 60 credits. Such fields include, but are not limited to, health science, biostatistics, biology, nursing, medicine, physical therapy, occupational therapy, physiatry, engineering, and psychology. Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in rehabilitation science may be pursued only on a part-time basis.

Certificate Requirements

A maximum of 3 credits in equivalent course work taken at another college or university can be applied toward the certificate.
Candidates must have 15 graduate credits and a minimum GPA of 3.00 in course work, with no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

Required Courses (12 credits)

- RHBS 550 - Foundations of Rehabilitation Science Credits: 3
- GCH 601 - Introduction to Biostatistics Credits: 3 or RHBS 620 - Psychosocial Aspects of Rehabilitation Credits: 3
- RHBS 710 - Applied Physiology I Credits: 3
- RHBS 711 - Applied Physiology II Credits: 3

Elective Course (3 credits)

Chosen in consultation with and approval of advisor.

- RHBS 506 - Clinical Exercise Physiology Credits: 3
- RHBS 510 - Scientific Basis for Pain and Fatigue Credits: 3
- RHBS 570 - Movement Analysis of Function Credits: 3
- RHBS 620 - Psychosocial Aspects of Rehabilitation Credits: 3
- RHBS 651 - Research Methods Credits: 3
- RHBS 702 - Biobehavioral Aspects of Health Credits: 3
- Another course may be count toward the certificate with prior approval of advisor.

Total: 15 credits

Doctoral Degree

Rehabilitation Science, PhD

Banner code: HH-PHD-RHBS

Unit: Rehabilitation Science

The PhD in Rehabilitation Science is an interdisciplinary program reflecting the need for integrated research to address the needs of the disabled. This program educates students in basic and translational science that address mechanisms, prevention and amelioration of disability. The objective of the program is to develop researchers and academics who, through their scholarship and original research, create new knowledge in rehabilitation science. Graduates of this program are prepared for professional careers in academic, governmental, and industrial research environments.

Admission Requirements

Applicants must hold a bachelor’s degree from a regionally accredited institution and have a minimum of a 3.0 GPA to be considered. Admission to the program is competitive, and a variety of criteria are evaluated in the admissions process, including
the strength of the undergraduate record and any post-baccalaureate coursework, the GRE, career goals statement, letters of recommendation, professional and/or volunteer experience, evidence of the ability to write and conduct research at the graduate level, and any additional evidence of potential success in the program. Applicants are encouraged to contact the department faculty prior to applying to discuss their interest. Preference will be given to full-time applicants, and interviews may be required by the faculty admissions committee. Information regarding CHHS application guidelines and requirements can be found at chhs.gmu.edu/admissions/graduate. Meeting the minimum application criteria does not guarantee admission.

Applications are considered for the fall semester only. For application deadlines and detailed application requirements, please refer to the Graduate Application Database. Late applications will be considered on a space-available basis. The online Application for Graduate Admissions can be found through the Office of Admissions.

Transfer of Credit

Transfer credit is governed by university transfer of graduate credit policy, the university requirements for doctoral degrees, and must be approved by the program director and the dean. Students who enroll initially through Nondegree Studies should seek course advising through the department prior to taking a course and must submit their application to the PhD program in their first semester of study.

Reduction of Credit

Students must complete a minimum of 72 graduate credits. A maximum of 30 credits may be waived in the PhD program based on a previously earned graduate degree. Credit for prior graduate coursework will be reviewed and awarded on a course-by-course basis.

Program Requirements

To complete the PhD in Rehabilitation Science, students must:

- Complete the program of study outlined in the PhD curriculum.
- Pass written doctoral candidacy comprehensive exam.
- Pass the final oral dissertation defense and submit a doctoral dissertation approved by the doctoral dissertation committee and the Chair of the Department of Rehabilitation Science (the dissertation must be submitted in the approved format of the doctoral program).
- Complete application material for graduation in accordance with prevailing Mason policies.

Advancement to Candidacy

Prior to beginning dissertation research, students must pass a written examination to demonstrate their qualification for advancement to candidacy.

Degree Requirements

The PhD in Rehabilitation Science program consists of a minimum of 72 credit hours, distributed among the following categories of courses: Foundation Courses (30 credits), Specialization Courses (15 credits), Electives (9 credits), and Dissertation Preparation and Completion Courses (18 credits). Specializations include: human motion, function and performance; biobehavioral health; and cardiorespiratory function and physical performance.

Fundamental Courses (30 credits)
• RHBS 550 - Foundations of Rehabilitation Science Credits: 3
• GCH 601 - Introduction to Biostatistics Credits: 3
• RHBS 620 - Psychosocial Aspects of Rehabilitation Credits: 3
• RHBS 651 - Research Methods Credits: 3
• RHBS 710 - Applied Physiology I Credits: 3
• RHBS 711 - Applied Physiology II Credits: 3
• RHBS 720 - Principles of Clinical Trials Credits: 3
• GCH 804 - Advanced Quantitative Data Analysis for Health Care Research I Credits: 3
• GCH 805 - Advanced Quantitative Data Analysis for Health Care Research II Credits: 3
• RHBS 816 - Comparative Effectiveness Research Credits: 3

Specialization Courses (15 credits)

Students select courses with the approval of their advisors. At least 9 credits must be taken in RHBS courses.

Specializations include:

• Human Motion, Function and Performance
• Biobehavioral Health
• Cardiorespiratory Function and Physical Performance

Elective Courses (9 credits)

Students will complete 9 hours of elective coursework, in consultation with their advisors.

Dissertation Preparation and Completion Courses (at least 18 credits)

• At least 6 credits: RHBS 960 - Directed Research Credits: 1-6
• At least 12 credits: RHBS 999 - Dissertation Research Credits: 1-9

Total: 72 credits

Social Work

Phone: 703-993-2030 (Undergraduate programs)
Phone: 703-993-4247 (Graduate programs)
web: socialwork.gmu.edu

Faculty
The mission of the BSW Program is to prepare entry-level generalist social work professionals who will demonstrate ethical leadership in innovative multidisciplinary practice, social reform, and research in diverse communities. Students are provided a range of opportunities to develop a broad knowledge and skills base consistent with the systems and strengths perspectives. They are expected to practice using core social work values and to examine and resolve ethical dilemmas. Classroom and field experiences prepare students to be competent in the use of relevant new technologies and in culturally sensitive generalist social work practice.

The MSW Program seeks to prepare social workers for advanced professional practice who are innovative leaders bringing superior management, interpersonal, technological, research, and communication skills to the human service delivery system. Through a concentration in either social change or clinical practice, graduates will be prepared to empower individuals, strengthen families and communities, stimulate positive change through advocacy, social and political action, and help meet the local, national, and global challenges of the new century. The MSW Program builds upon a foundation of generalist social work knowledge and skills that integrates micro and macro theory and practice and emphasizes empowerment and systems transformation. This foundation equips students to enhance human well-being and to promote social and economic justice through ethical professional practice with culturally diverse individuals, families, groups, organizations, and communities.

Part-time students are encouraged to take at least 6 credits per semester to promote timely completion of the program.

Undergraduate Degree

Social Work, BSW

Banner Code: HH-BSW-SOCW

Unit: Social Work

The undergraduate social work program prepares students for beginning generalist professional practice in social work at the baccalaureate level and has been granted full accreditation by the Council on Social Work Education. All students are expected to abide by the Code of Ethics of the National Association of Social Workers.

No academic credit toward field experience or course work is given based on previous work or life experience. Since the social work program does not offer all of the required courses during the evening hours, students should meet with their academic advisor to develop a plan to complete course work for the degree.

Admission Requirements

To be admitted to the social work program, a student must have completed at least 45 credits with a GPA of 2.50; completed or be registered in BIOL 103, ENGH 101, SOCI 101, and PSYC 100; earned at least a C in SOCW 200, 301, 323, 351, and 357; satisfactorily completed at least 60 hours in one semester in a service learning agency in conjunction with SOCW 301; and submitted an application for the social work major to the director of social work admissions. Students should file this application during the junior year. The student’s application for admission to the social work major is reviewed for action by social work faculty members. A personal interview may be required.
There is no admission to the social work program in the summer. Students who have not met all criteria for admission to the major (including completion of service learning requirements) by May 30 will not be considered for admission until the fall semester.

**Immunization and Fees**

All students who are enrolled in a course that requires a field placement (SOCW 301, 453, and 456) must have an annual tuberculosis screening (PPD). In addition, students must complete the entire hepatitis B immunization series in accordance with current U.S. Public Health Service recommendations. The cost of immunizations is the responsibility of the student. The majority of agencies used for field placements require fingerprinting, a criminal background check (may be more extensive than the university requirement), and a child protective services check. Any cost related to these requirements is the responsibility of the student.

**Writing Intensive Requirement**

The university requires all students to complete at least one course designated “writing intensive” in the 300 level or above. Students majoring in social work fulfill this requirement by successfully completing SOCW 471.

**Degree Requirements**

Students must fulfill all requirements for the bachelor's degree including university general education requirements.

**General Education and Required Courses (49–51 credits)**

**Composition:**

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3

**Oral Communication:**

- An approved University General Education oral communications class.

**Quantitative Reasoning:**

- An approved University General Education quantitative reasoning course.

**Information Technology:**

- An approved University General Education information technology course.

**Literature:**
• An approved University General Education literature course.

Arts:

• An approved University General Education arts course.

Natural Science:

• BIOL 103 - Introductory Biology I Credits: 4
• One 3 or 4 credit approved University General Education natural science course.

Western Civilization:

Choose one of the following:

• HIST 100 - History of Western Civilization Credits: 3
• HIST 125 - Introduction to World History Credits: 3

Global Understanding:

• An approved University General Education global understanding course.

American Government:

Choose one of the following:

• GOVT 103 - Introduction to American Government Credits: 3
• GOVT 132 - Introduction to International Politics Credits: 3

Psychology:

• PSYC 100 - Basic Concepts in Psychology Credits: 3

Sociology:

• SOCI 101 - Introductory Sociology Credits: 3

Statistics:

Choose one of the following:
- SOCI 313 - Statistics for the Behavioral Sciences Credits: 4
- PSYC 300 - Statistics in Psychology Credits: 4
- STAT 250 - Introductory Statistics I Credits: 3

Philosophy or Religion:

- PHIL or RELI course: Credits: 3

Social Work Major (44 credits)

- SOCW 200 - Introduction to Social Work Credits: 3
- SOCW 301 - Laboratory in Interpersonal Communication Credits: 4
- SOCW 323 - Human Behavior and the Life Course Credits: 3
- SOCW 340 - Human Behavior within Macro Systems Credits: 3
- SOCW 351 - Social Policy and Social Justice Credits: 3
- SOCW 357 - Methods of Social Work Intervention I Credits: 3
- SOCW 358 - Methods of Social Work Intervention II Credits: 3
- SOCW 362 - Group and Family Interventions Credits: 3
- SOCW 370 - Social Policy Analysis and Advocacy Credits: 3
- SOCW 417 - Integrative Methods in Social Action and Social Change Credits: 3
- SOCW 452 - Senior Seminar I Credits: 2
- SOCW 453 - Senior Practicum I Credits: 3
- SOCW 454 - Senior Seminar II Credits: 2
- SOCW 456 - Senior Practicum II Credits: 3
- SOCW 471 - Research in Social Work Credits: 3

Electives (25-27 credits)

- Six credits must be in social work at the 400- or 500-level, not including courses listed above; SOCW 499 may be used to satisfy an additional 1 to 3 credits toward general electives.

Total: 120 credits

Notes:

SOCW 110 Global Perspectives on Human Rights is open to all students, but it does not count toward social work degree requirements.

SOCW 323 has been approved as a university synthesis course and is open to all majors.

The Social Work faculty evaluates student performance periodically and may require students to withdraw from the program when, in their judgment, performance is not satisfactory. The decision is based on the quality of academic and field performance, as well as on personal fitness for the profession of social work. Students have the right to appeal.
Class attendance is required in all Social Work courses.

SOCW 301 can only be taken in the fall semester and is a prerequisite to SOCW 359. SOCW 323, 351, and 357 are sequenced courses offered only during the fall semester. The second parts, SOCW 324, 352, and 358/359, are offered only during the spring semester and can only be taken on successful completion of the first parts (a grade of C or better). The sequencing requirement pertains only to social work majors. Graduation will be delayed if courses are not taken in proper sequence.

**Undergraduate Minor**

**Aging Studies Minor**

**Banner code:** AGES

**Unit:** Social Work

The minor in aging studies combines theoretical and applied course work in aging with the student’s undergraduate curriculum in any department of the university. Because aging studies is by definition multidisciplinary, students are required to take course work outside their major field. The undergraduate minor is administered by CHHS and housed in the Department of Social Work.

**Course Work**

Students should be familiar with university-wide requirements for minors described in the Undergraduate Policies section of the Academic Policies chapter of this catalog.

**Required Core Courses (12 credits)**

- HHS 432 - Healthy Aging Credits: 3
- HHS 480 - Research Internship in Health and Human Services Credits: 3
- PSYC 415 - Psychological Factors in Aging Credits: 3
- SOCW 435 - Introduction to Gerontology Credits: 3

**Elective (3 credits)**

- GCH 480 - Health Maintenance and Health Aspects of Aging Credits: 3
- PSYC 418 - Death, Dying, and Grieving Credits: 3
- Other aging-related course as approved by the program coordinator

**Total: 15 credits**
Social Work Minor

Banner Code: SOCW

Unit: Social Work

Course Work

Minor courses must be completed with a minimum GPA of 2.00.

Students should be familiar with university-wide requirements for minors described in the Undergraduate Policies section of the Academic Policies chapter of this catalog.

Required Courses (13 credits)

- SOCW 200 - Introduction to Social Work Credits: 3
- SOCW 301 - Laboratory in Interpersonal Communication Credits: 4
- SOCW 323 - Human Behavior and the Life Course Credits: 3
- SOCW 351 - Social Policy and Social Justice Credits: 3

Electives (6 credits)

- Social work electives (6)

Total: 19 credits

Note:

SOCW 357, 358, 359, 452, 453, 454, and 456 are not open to minors. See an advisor in the social work program for more information.

Dual Degree

Social Work and Conflict Analysis and Resolution Dual Degree, MSW (CHHS)

Banner Codes: HH-MSW-SOCW and CA-MS-CONF

Unit: Social Work

The Department of Social Work is partnering with George Mason’s nationally recognized School for Conflict Analysis & Resolution (S-CAR) to offer a 3-year dual degree program. Students can earn both an MSW and an MS in Conflict Analysis &
Resolution while taking advantage of the diversity of the Washington, DC metropolitan area and the University’s proximity to the nation’s capital. This is the only existing dual degree program of its kind.

**Admission Requirements**

Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall semester only.

Students interested in the 3-year dual degree program submit one online Application for Graduate Admission, select the MSW in Social Work as a primary program, and submit all application support materials, including the MSW Application Materials to the Office of Graduate Admission in the College of Health and Human Services. Applicants should communicate their interest in completing the dual degree program in their essays, and recommendations should address the dual program interest. Students must be admitted to both programs in the same semester (fall only) to be admitted to the dual degree program.

For application deadlines and detailed application requirements please refer to the Graduate Application Database. Interested students should consult the MSW program website and the MSW program director for additional information prior to applying.

**Transfer of Credit**

Transfer credit is governed by university transfer of graduate credit policy and the university requirements for master’s degrees, and transfer credits must be approved by the program director and the dean. Students who enroll initially through Nondegree Studies should seek course advising through the department prior to taking a course, and plan to submit their application to the dual degree program as soon as possible.

Please refer to the Transfer of Credit policy for the MSW in Social Work or departmental transfer policy for graduate Social Work courses taken at another institution and for the maximum number of credits allowed to be transferred from Nondegree Studies.

**Degree Requirements**

*To graduate with the dual degree, students must successfully complete the following:*

**Social Work Courses (51 credits)**

- SOCW 623 - Human Behavior and Social Systems I Credits: 3
- SOCW 624 - Human Behavior and Social Systems II Credits: 3
- SOCW 651 - Social Policies, Programs, and Services Credits: 3
- SOCW 652 - Influencing Social Policy Credits: 3
- SOCW 657 - Direct Social Work Practice I Credits: 3
- SOCW 658 - Direct Social Work Practice II Credits: 3
- SOCW 670 - Communication and Technology for Social Work Practice Credits: 3
- SOCW 672 - Foundation Field Practicum and Seminar I Credits: 3
- SOCW 673 - Foundation Field Practicum and Seminar II Credits: 3
- SOCW 684 - Social Work and the Law Credits: 3
- SOCW 685 - Organizational Leadership for Social Workers Credits: 3
- SOCW 687 - Empowering Communities for Change Credits: 3
- SOCW 688 - Advanced Research in Social Work Credits: 3
• SOCW 694 - Social Change Practicum I Credits: 3
• SOCW 695 - Social Change Practicum II Credits: 3
Choose two of the following:
• SOCW 653 - Immigration Policy Credits: 3
• SOCW 654 - Social Policy for Children and Youth Credits: 3
• SOCW 655 - Aging Programs and Policies Credits: 3

Conflict Analysis and Resolution Courses (35 credits)

• CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3
• CONF 601 - Theories of Conflict and Conflict Resolution Credits: 3
• CONF 610 - Philosophy and Methods of Conflict Research Credits: 3
• CONF 620 - Reflective Practice in Interpersonal-Multiparty Conflicts Credits: 3
• CONF 642 - Integration of Theory and Practice Credits: 3
• CONF 694 - Internship Credits: 1-6
• CONF 795 - Professional Development Seminars Credits: 1-2
  5 credits of Professional Development Seminars are required

Electives

• 12 credits of CONF Electives, selected with approval from S-CAR

Total: 86 credits

Master's Degree

Social Work, MSW

Banner Code:  H-MSW-SOCW

Unit: Social Work

The MSW Program opened its doors in fall 2002 and was fully accredited by the Council on Social Work Education in spring 2006. The MSW Program prepares students for advanced practice in social work. Following completion of a foundation year of study, students complete specialized concentrations in social change or clinical practice. All social work students are expected to abide by the Code of Ethics of the National Association of Social Workers. No academic credit toward field experience or course work is given based on previous work or life experience.

To accommodate students, MSW courses are offered during the day and evening hours. Field placements, however, generally require availability during regular daytime hours. Students are required to successfully complete 1,200 hours of supervised field practicum in agencies approved by the Department of Social Work. Students may complete the MSW Program under a two-year or three-year plan, but all courses are sequenced and must be taken in the order designated. Students should meet with their academic advisor to ensure timely completion of all degree requirements.
Admission Requirements

Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog and apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall semester only. In addition to holding an undergraduate degree from a regionally accredited college or university, applicants must have a minimum of 30 undergraduate credits in the liberal arts to include at least 3 credits in each of the following: English composition, history or government, social sciences, and statistics. For application deadlines and detailed application requirements, please refer to Graduate Application Database.

Transfer of Credits

Students who began MSW programs at another CSWE-accredited MSW program may transfer a maximum of 29 graduate credits into the MSW in Social Work program, with the exception of SOCW 670, and for the concentration year courses: SOCW 630, 640, 645, 674, 684, 685, 687, 692, 693, 695, 695, or 697. Transfer credit is subject to university and college policies and must be approved by the program director and the dean.

Students who enroll initially at Mason through Nondegree Studies may transfer a maximum of 9 credits into the MSW program. Nondegree students should seek advising through the department and plan to submit their application to the MSW program in their first semester of study.

Program Requirements

To remain in good standing, students must earn a B- or better in each required course and maintain a 3.00 GPA. A prerequisite must be satisfied with a B- or better before registering for the next course in a sequence. A course in which the student earns a C may be repeated once. No more than 8 total credits of C may be repeated overall.

Social Work faculty members evaluate each student’s performance periodically and may require the student to withdraw from the program when, in their judgment, performance is not satisfactory. The decision is based on the quality of academic and field performance, as well as on personal fitness for the profession of social work. The student has the right to appeal.

Insurance Coverage

Students engaged in internships are covered for liability under the Commonwealth of Virginia’s Self-Insured Liability Insurance Plan and covered for medical malpractice under the Medical Malpractice Insurance Plan, as established by the Department of General Services, Division of Risk Management. Only practicum activities that have been determined by the field instructor to be part of the course are covered. Students are encouraged to obtain professional liability coverage through the National Association of Social Workers, although this additional coverage is optional.

Immunizations

All students who are enrolled in a course that requires a field placement (SOCW 672, 673, 692, 693, 694, 695) must have an annual tuberculosis screening (PPD). In addition, students must complete the entire Hepatitis B immunization series in accordance with current U.S. Public Health Service recommendations. Any cost related to these requirements is the responsibility of the student. Students can register for classes prior to the completion of the immunizations but documentation of completion must be submitted to the social work office no later than October 1 for fall entrance. Immunizations are program requirements and must be completed by the student even if they are not required by the agency. Documentation must be submitted to the MSW Program administrative assistant.
Degree Requirements

Nondegree students must seek department approval before registering for courses. Nondegree students may take up to 9 credits total which may be transferred into the program once they are admitted. Courses available to nondegree students include: SOCW 670, SOCW 623 and SOCW 624, or SOCW 651 and SOCW 652.

In order to graduate with the MSW degree, students must successfully complete the following foundation courses and courses under one concentration.

Foundation Courses (30 credits)

- SOCW 623 - Human Behavior and Social Systems I Credits: 3
- SOCW 624 - Human Behavior and Social Systems II Credits: 3
- SOCW 651 - Social Policies, Programs, and Services Credits: 3
- SOCW 652 - Influencing Social Policy Credits: 3
- SOCW 657 - Direct Social Work Practice I Credits: 3
- SOCW 658 - Direct Social Work Practice II Credits: 3
- SOCW 670 - Communication and Technology for Social Work Practice Credits: 3
- SOCW 671 - Research Methods for Social Workers Credits: 3
- SOCW 672 - Foundation Field Practicum and Seminar I Credits: 3
- SOCW 673 - Foundation Field Practicum and Seminar II Credits: 3

Concentration (30 credits)

Students must complete all Foundation Courses before beginning Concentration Courses.

▲ Clinical Practice Concentration (CLNP)

Core Courses (18 credits)

- SOCW 640 - Advanced Clinical Practice Credits: 3
- SOCW 645 - Community-Centered Clinical Practice Credits: 3
- SOCW 674 - Psychopathology Credits: 3
- SOCW 688 - Advanced Research in Social Work Credits: 3
- SOCW 692 - Clinical Practicum I Credits: 3
- SOCW 693 - Clinical Practicum II Credits: 3

Advanced Clinical Practice Courses (6 credits)

Choose two:

- SOCW 630 - Forensic Social Work Practice Credits: 3
• SOCW 677 - Family Therapy Credits: 3
• SOCW 678 - Trauma and Recovery Credits: 3
• SOCW 679 - Military Social Work Credits: 3
• SOCW 682 - Substance Abuse Interventions Credits: 3
• SOCW 689 - Clinical Practice with Older Adults Credits: 3

Advanced Policy Course (3 credits)

Choose one:

• SOCW 653 - Immigration Policy Credits: 3
• SOCW 654 - Social Policy for Children and Youth Credits: 3
• SOCW 655 - Aging Programs and Policies Credits: 3

Elective (3 credits)

Choose one:

• SOCW 675 - Selected Topics in Clinical Practice Credits: 3
• SOCW 684 - Social Work and the Law Credits: 3
• SOCW 685 - Organizational Leadership for Social Workers Credits: 3
• SOCW 687 - Empowering Communities for Change Credits: 3
• SOCW 697 - Thesis Project Seminar Credits: 3

Students may select an elective from the list of Advanced Clinical Practice Courses or Advanced Policy Courses

▲ Social Change Concentration (SOCC)

Core Courses (18 credits)

• SOCW 684 - Social Work and the Law Credits: 3
• SOCW 685 - Organizational Leadership for Social Workers Credits: 3
• SOCW 687 - Empowering Communities for Change Credits: 3
• SOCW 688 - Advanced Research in Social Work Credits: 3
• SOCW 694 - Social Change Practicum I Credits: 3
• SOCW 695 - Social Change Practicum II Credits: 3

Advanced Policy Courses (6 credits)

Choose two:

• SOCW 653 - Immigration Policy Credits: 3
• SOCW 654 - Social Policy for Children and Youth Credits: 3
• SOCW 655 - Aging Programs and Policies Credits: 3

Electives (6 credits)

Choose two:

• SOCW 674 - Psychopathology Credits: 3
• SOCW 676 - Selected Topics in Social Work and Social Change Credits: 3
• SOCW 697 - Thesis Project Seminar Credits: 3

Students may select an elective from the list of Advanced Policy Courses or Advanced Clinical Practice Courses.

Total: 60 credits

Advanced Standing

Students with a BSW degree who demonstrate superior academic achievement and excellence in social work practice will be considered for advanced standing. Advanced standing students begin the MSW Program in the summer and upon successfully completing SOCW 670, move directly into the concentration year. Advanced standing students must successfully complete 600 hours of supervised field practicum in agencies approved by the Department of Social Work.

All other academic policies for the advanced standing program are identical to those for the regular MSW Program.

Admission Requirements

Applicants must meet the admissions standards and application requirements specified in the Admission chapter of the catalog, and apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall admissions cycle only, with advanced standing students beginning courses in the summer. In addition to holding a BSW in Social Work earned within the past five years from a program accredited by the Council on Social Work Education, applicants must have a minimum of 30 undergraduate credits in the liberal arts to include at least 3 credits in each of the following: English composition, history or government, social sciences, and statistics. For application deadlines and detailed application requirements please refer to Graduate Application Database.

To graduate with the MSW degree, advanced standing students must successfully complete the following foundation course in the summer prior to beginning the concentration year, and complete courses under one concentration.

Foundation Course (3 credits)

• SOCW 670 - Communication and Technology for Social Work Practice Credits: 3

Concentration (30 credits)
Students must complete all Foundation Courses before beginning Concentration Courses.

▲ Clinical Practice Concentration (CLNP)

Core Courses (18 credits)

- SOCW 640 - Advanced Clinical Practice Credits: 3
- SOCW 645 - Community-Centered Clinical Practice Credits: 3
- SOCW 674 - Psychopathology Credits: 3
- SOCW 688 - Advanced Research in Social Work Credits: 3
- SOCW 692 - Clinical Practicum I Credits: 3
- SOCW 693 - Clinical Practicum II Credits: 3

Advanced Clinical Practice Courses (6 credits)

Choose two:

- SOCW 630 - Forensic Social Work Practice Credits: 3
- SOCW 677 - Family Therapy Credits: 3
- SOCW 678 - Trauma and Recovery Credits: 3
- SOCW 679 - Military Social Work Credits: 3
- SOCW 682 - Substance Abuse Interventions Credits: 3
- SOCW 689 - Clinical Practice with Older Adults Credits: 3

Advanced Policy Course (3 credits)

Choose one:

- SOCW 653 - Immigration Policy Credits: 3
- SOCW 654 - Social Policy for Children and Youth Credits: 3
- SOCW 655 - Aging Programs and Policies Credits: 3

Elective (3 credits)

Choose one:

- SOCW 675 - Selected Topics in Clinical Practice Credits: 3
- SOCW 684 - Social Work and the Law Credits: 3
- SOCW 685 - Organizational Leadership for Social Workers Credits: 3
- SOCW 687 - Empowering Communities for Change Credits: 3
- SOCW 697 - Thesis Project Seminar Credits: 3

Students may select an elective from the list of Advanced Clinical Practice Courses or Advanced Policy Courses
Social Change Concentration (SOCC)

Core Courses (18 credits)

- SOCW 684 - Social Work and the Law Credits: 3
- SOCW 685 - Organizational Leadership for Social Workers Credits: 3
- SOCW 687 - Empowering Communities for Change Credits: 3
- SOCW 688 - Advanced Research in Social Work Credits: 3
- SOCW 694 - Social Change Practicum I Credits: 3
- SOCW 695 - Social Change Practicum II Credits: 3

Advanced Policy Courses (6 credits)

Choose two:

- SOCW 653 - Immigration Policy Credits: 3
- SOCW 654 - Social Policy for Children and Youth Credits: 3
- SOCW 655 - Aging Programs and Policies Credits: 3

Electives (6 credits)

Choose two:

- SOCW 674 - Psychopathology Credits: 3
- SOCW 676 - Selected Topics in Social Work and Social Change Credits: 3
- SOCW 697 - Thesis Project Seminar Credits: 3

Students may select an elective from the list of Advanced Policy Courses or Advanced Clinical Practice Courses

Total: 33 credits

Master's Level Certificate

Gerontology Graduate Certificate

Banner Code: HH-CERG-GERO

Unit: Social Work
The graduate certificate program in gerontology combines theoretical and applied course work in aging with the student’s graduate curriculum in any department. Because gerontology is by definition multidisciplinary, students are required to take course work outside their major field. The program is administered by CHHS and housed in the Department of Social Work.

### Admission Requirements

Applicants must meet the admission standards and application requirements specified in the Admission chapter of the catalog and must apply using the online Application for Graduate Admission. The application process is competitive, and applications are considered for the fall and spring semesters. For application deadlines and detailed application requirements please refer to Graduate Application Database.

The graduate certificate in gerontology may be pursued on a part-time or full-time basis.

### Certificate Requirements

Candidates must earn 15 graduate credits with a minimum GPA of 3.00 in course work, and no more than 3 credits with a grade of C to earn the certificate. Detailed requirements for graduate certificates are listed in the Graduate Policies section of the catalog.

#### Required Core Courses (12 credits)

- SOCW 689 - Clinical Practice with Older Adults Credits: 3
- PSYC 614 - The Psychology of Aging Credits: 3
- RHBS 761 - Aging and Health Behavior Credits: 3
- SOCW 655 - Aging Programs and Policies Credits: 3 or HAP 662 - Health Policy for Elders and People with Disabilities Credits: 3

#### Choose One Elective Course (3 credits) from the following:

- HAP 650 - Senior Housing Management and Operations Credits: 3
- HAP 662 - Health Policy for Elders and People with Disabilities Credits: 3
- SOCW 655 - Aging Programs and Policies Credits: 3

Total: 15 credits
College of Humanities and Social Sciences

Phone: 703-993-8720
Web: chss.gmu.edu
College Code: LA

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- Psychology
- Public and International Affairs
- Religious Studies
- Sociology and Anthropology
- New Century College

Interdisciplinary Programs

- African and African American Studies
- Cultural Studies
- Global Affairs
- Higher Education
- Honors Program in General Education
- Individualized Study (BIS)
- Interdisciplinary Studies (MAIS)
About the College

The College of Humanities and Social Sciences (CHSS) is composed of 11 departments and 10 major interdisciplinary programs. The college is also home to New Century College, which offers an innovative interdisciplinary major as well as Mason Cornerstones, a first-year program for students in all majors. Together with the College of Science, the college administers the university-wide Honors Program in General Education, the academic program of the Honors College. This is open to qualified students from all majors in the university. The college has a distinguished faculty of more than 400, including a Nobel laureate and recipients of the Pulitzer Prize and Guggenheim Fellowship.

At the undergraduate level, all programs emphasize challenge, opportunity, and success. They challenge students to think critically and creatively and to go beyond what is required by pursuing research experiences, minors, double majors, honors in the major, and accelerated master’s degree programs, which enable them to earn both an undergraduate and a graduate degree, often within five years. They provide many opportunities beyond the classroom including study abroad programs, service learning, internships, and career-enhancing courses and minors, all of which will help prepare them for success beyond college.

At the graduate level, programs of study provide opportunities for career development and advancement, professional education, participation in research, and personal fulfillment.

All programs encourage the exploration of contemporary issues through a dynamic curriculum that fosters an informed understanding of real world problems. The college provides students with an education that enables them to think critically, adapt to the changing conditions of society, and provide informed leadership to future generations.

Policies for All Students

The requirements for each academic program offered by the college are described in the sections for the sponsoring departments and programs. All students are subject to the policies stated in the Academic Policies chapter of this catalog. Additional policies and procedures for students in the college are presented in this chapter.

Mason uses only Mason e-mail accounts to communicate with enrolled students. Students should activate their Mason e-mail account, use it to communicate with their department and other administrative units, and check it regularly for important information.

Registration and Degree Audit
Students are responsible for correctly registering for courses and paying all tuition and fees by the official university registration and payment deadlines. Instructors do not have the authority to add students to courses, and students may not sit in on classes for which they are not registered. All students should verify the accuracy of their enrollment before the end of the add period and should check Patriot Web to verify that they are registered for the classes that they think they are.

All students are responsible for reviewing their own transcripts and degree audits regularly to ensure that they are correct and that they are on track to meet all their requirements.

Withdrawal

Students are responsible for all courses in which they remain officially enrolled once the drop period has ended. Instructors do not have the authority to withdraw students from classes. Withdrawals after the published deadlines require the approval of the relevant dean (undergraduate academic affairs or graduate academic affairs) and are typically allowed only for full semesters at a time (a withdrawal from all enrolled courses). Withdrawals are only permitted for non-academic reasons; no withdrawals can be approved for academic reasons. When submitting a withdrawal request, students must provide verifiable, third-party documentation for the reason for the withdrawal. Requests for withdrawals should be submitted as early in the semester as possible and never after the last day of classes.

Grade Appeals

Grade appeals should be made to the department or program following the process specified in the Academic Policies chapter of this catalog. If they are resolved within the department or program, that unit is the final level of appeal. The departmental decision may be appealed to the dean only on the basis of procedural irregularity. Undergraduate students should address such appeals through the Office of Undergraduate Academic Affairs and graduate students through the Office of Graduate Academic Affairs. If the grade appeal is not resolved within the department or program, the chair makes a recommendation to the dean, who makes the final determination. The decision of the dean is not subject to review or further appeal.

Formal Complaints

Formal complaints should be made in writing to the associate dean.

Accommodations for Students with Disabilities

Students with documented disabilities should contact the Office of Disability Services to open a file and learn more about accommodations that may be available to them.

Policies for Undergraduate Students

The college offers 17 bachelor of arts (BA) degrees, 6 bachelor of science (BS) degrees, and a bachelor of individualized study (BIS) degree. The undergraduate degree consists of course work in four areas: university-wide general education requirements, college requirements for the bachelor's degree, requirements specified for the chosen major, and electives. All students must complete 120 credits, of which at least 45 must be in upper-level courses (numbered 300 and above). At least one course at the 300 or 400 level must be designated “writing intensive.”

Students should consult the General Education and College Requirements for information concerning the ways they can fulfill university-wide general education requirements and college requirements for undergraduate degrees. Transfer students are encouraged to meet with their academic advisor prior to registering for classes to review their transcripts and course equivalencies. In some cases, students may need to earn more than 120 credits to complete all of their requirements.
The college cooperates with the School for Conflict Analysis and Resolution (SCAR) to provide courses from various disciplines in the college toward a BA, BS, and minor in conflict analysis and resolution (CAR). More information about CAR undergraduate degree programs can be found in the School for Conflict Analysis and Resolution chapter of this catalog.

Questions about Academic Policies for Undergraduates

Students with questions about exceptions to academic policies and about college requirements should contact the Office of Undergraduate Academic Affairs (Robinson Hall, Room A255; 703-993-8725; chssdean@gmu.edu).

Additional policy information and forms are available online from the Office of Undergraduate Academic Affairs.

Academic Load

Students should review university policies regarding academic load in the Academic Policies chapter of this catalog.

In order to be considered for an overload, students must fulfill all of the following criteria:

- Be in good academic standing
- Have completed the prior semester with a GPA of 2.33 or higher
- Have a cumulative GPA of 2.33 or higher
- Have demonstrated in prior semesters at Mason the ability to handle an increased and demanding course load while maintaining high performance
- Have no remaining incompletes (INs) from a previous semester

Freshmen and transfer students in their first semesters are not given permission for overloads as they have yet to establish an academic record at George Mason University.

If approved for an overload, the student is responsible for adding the additional class(es) and paying for the related tuition by the official university deadlines.

Excluded Courses and Credits

Physical Education (PHED) and Parks, Recreation, and Leisure Studies (PRLS) activity courses cannot be used for credit for a degree in the College of Humanities and Social Sciences.

MLSC 400 and MLSC 401 can be used for credit for a degree in the college, but credit from other MLSC courses may not be used for credit for a degree in the college.

Once matriculated at Mason, students may not take CLEP exams and apply credits from those exams to a degree in the college. Students may apply credits from CLEP exams to a degree in the college only if those credits were awarded and reported prior to matriculation.

University Consortium

Students should review university policies regarding the University Consortium under Special Registration Procedures in the Academic Policies chapter of this catalog. Students who have attempted or failed a course at Mason are not permitted to take the equivalent course through the consortium under any circumstances. All consortium registration requests must be submitted to the dean's office at least 3 weeks prior to the first day of classes for the relevant semester at Mason.

Permission to Study Elsewhere
Students enrolled at George Mason University are expected to complete their coursework with George Mason courses. Exceptions to this policy are rare and are considered only under extraordinary circumstances on a case-by-case basis. Students must obtain advance, written approval from their department or program and the dean’s office before enrolling in classes elsewhere. No approvals for study elsewhere will be granted once the coursework at the other institution has been completed.

To be eligible to study elsewhere and be considered for an exception to the enrollment policy, students must have completed the immediately preceding semester with a minimum GPA of 2.00 and not be in danger of academic probation, suspension, or dismissal. Freshmen and new transfer students are not allowed to take courses elsewhere as they have yet to establish an academic record at George Mason. Since transfer students have generally already transferred a considerable number of credits, they are expected to take all remaining courses at George Mason. Requests to take community college courses can seldom be approved. Students who wish to take courses offered at Consortium universities must apply in advance and register through the Consortium Coordinator. They cannot request permission to take course courses at consortium institutions using the regular study elsewhere process.

Courses elsewhere that have been pre-approved by the dean’s office must be taken for a grade and passed with a minimum grade of 2.00 in order to be transferred to George Mason. Although credit for the course can be transferred, the grade for the course does not. It will not be factored into the student's GPA.

Approval for study elsewhere is specific to the term and courses for which it is granted. If a student does not complete the course(s) elsewhere during the approved term, the student must submit a new study elsewhere request to take the course(s) at a later date. Similarly, enrollment in additional or alternate courses at another institution will not be considered for transfer after the fact. Approval for study elsewhere during a given semester does not guarantee approval in a later term.

Students must make arrangements with the visited institution to have an official transcript mailed directly to the George Mason Office of the University Registrar immediately after the course work is completed. Credit cannot be transferred until an official transcript is received.

### Study Abroad

In order to be considered for study through the Center for Global Education, students must plan well in advance and receive prior, written permission from the dean. Students must also meet all of the following criteria:

- Meet all eligibility requirements for their program as specified by the Center for Global Education including course prerequisites and minimum GPA
- Have completed the immediately preceding semester at Mason with a minimum GPA of 2.00
- Have completed the necessary forms and have obtained all required signatures and course equivalencies

Students in danger of probation, suspension, or dismissal should plan very carefully before requesting to study abroad. Students who are not in good academic standing will not be permitted to study abroad.

### Withdrawals

Students should review the Withdrawal section in the Academic Policies chapter of this catalog. Courses for which a withdrawal is approved receive a grade of "W".

Students should be aware of the potential consequences of withdrawing on their academic standing. Though credits graded "W" do not affect a student's GPA, they do count towards the total attempted hours. The total attempted hours and cumulative GPA together determine a student’s academic standing. These are explained in the Academic Standing section of the Academic Policies chapter of the catalog.

### Academic Clemency
Students should review the university policies regarding academic clemency in the Academic Standing section of the Academic Policies chapter of this catalog.

To be considered for clemency, students must meet all of the following criteria:

- Be absent from George Mason for a minimum of three consecutive calendar years
- Provide a detailed explanation for why they were unsuccessful in those courses and how they have made changes to ensure their academic progress upon their return
- Submit their request within 12 months of the first day of the re-enrollment term
- Complete at least 6 credits during their first 12 months back at George Mason
- Earn a minimum GPA of 2.50 each semester back prior to making the clemency request with no individual grade below 2.00

If the last three minimum academic requirements are not met, clemency will not be allowed under any circumstances.

**Appeals Process**

Students may appeal departmental decisions concerning academic actions to the Office of Undergraduate Academic Affairs. They may appeal decisions of the Office of Undergraduate Academic Affairs to the Dean’s Council, a committee composed of college deans and faculty members. Students may appeal decisions of the Dean’s Council to the Student Policies and Appeals Committee, a standing committee elected by the college faculty. These levels of appeal are subject to the limits below concerning the final level of appeal for each type of academic action. Students who feel that the college appeal process was conducted unfairly may appeal to the Provost’s Office as specified in the Academic Policies chapter of this catalog.

The grade appeal process is discussed above.

Departments set the requirements for the majors and minors that they administer. Substitutions and waivers of these requirements require the approval of the Office of Undergraduate Academic Affairs. When a department denies a substitution or waiver of a requirement, the denial may be appealed to the Office of Undergraduate Academic Affairs on the basis of procedural irregularity only. That office is the final level of appeal.

The Dean’s Council is the final level of appeal for course overloads, consortium registration, study elsewhere, and withdrawals after the drop deadline within the semester. Appeals of these decisions may be made to the Student Policies and Appeals Committee on the basis of procedural irregularity only, and the committee is the final level of appeal on procedural grounds.

Student Policies and Appeals Committee is the final level of appeal for college-level requirements, retroactive actions (adds, withdrawals, and graduation), and return from suspension and dismissal. This committee is the final level of approval.

There is no waiver or appeal of satisfactory performance standards (minimum grades or grade point average (GPA)) that have been set by the department or program faculty for the courses in their major or minor.

Students should file all appeals in a timely manner, usually within the semester in which the original decision is rendered, but no later than the final day of classes of the following semester.

**Teacher Licensure**

Students who plan to seek teacher licensure and become K–12 teachers should consult the College of Education and Human Development chapter of this catalog and attend an information session early in their undergraduate career. For more information, call 703-993-2892, e-mail gseadmit@gmu.edu, or see the College of Education and Human Development web page.

**Second Bachelor's Degree**

Students should review the university policies regarding second bachelor’s degrees in the Undergraduate Admissions Policies and in Academic Policies/Requirements for Undergraduate Programs sections of the catalog. Students pursuing a second
bachelor’s degree concurrently with their first bachelor’s degree at Mason must meet all the college-level requirements if they differ from the requirements in the college of their first major.

Students pursuing a second bachelor’s degree in the college after already having received one or more bachelor’s degrees are considered to have met all of Mason’s university general education requirements. Students pursuing a bachelor of science degree do not have additional college-level requirements. Students pursuing a bachelor of arts degree in the college must complete these additional college-level requirements: one additional 3-credits course each in philosophy or religious studies, in social and behavioral science, and in non-western culture (for a total of 9 credits). They must also demonstrate proficiency in a foreign language through the intermediate level. For more information about college-level requirements see General Education and College Requirements.

Minors

Students may elect to take a minor in addition to their major field of study. For policies governing all minors, see the Academic Policies chapter of this catalog. Students interested in earning a minor should complete the appropriate section of the Change/Declaration of Academic Program form and submit it to the Office of the University Registrar. See All about Minors for more information.

College-Level Requirements for Undergraduate Students

Bachelor of Arts

The BA degree provides students with a breadth of knowledge as well as the necessary skills to make in-depth study of a major truly meaningful. In addition to the university-wide general education program, students pursuing a BA degree must complete the course work below. Except where expressly prohibited, a course used to fulfill a college-level requirement may also be used simultaneously to satisfy other requirements (university-wide general education requirements or requirements for the major).

- Philosophy or religious studies: 3 credits fulfilled by any course in philosophy or religious studies (PHIL, RELI) except for PHIL 323, 324, 427, 428.
- Social and behavioral science: 3 credits in addition to the university-wide requirement in social and behavioral science for a total of 6 credits. The two courses used to fulfill the combined college and university requirements must be from different disciplines in the social and behavioral sciences. This requirement may be fulfilled by completing any course in ANTH, CRIM, ECON, GOVT, HIST (except 100 or 125), LING, PSYC, or SOCI and these courses in GGS: 101, 103, 110, 301, 303, 304, 305, 306, 315, 316, 320, 325, 330, 357, 380.
- Natural science: 1 credit in addition to the university-wide requirement for a total of 8 credits. This requirement must be fulfilled by completing two of any approved natural science courses that include a laboratory experience. This requirement may not be fulfilled by BIOL 124 or 125.
- Foreign language: intermediate-level proficiency in one foreign language. This requirement may be fulfilled by completing a course in a foreign language numbered 202, 209, or 210 (or higher level courses taught in the language) or achieving a satisfactory score on an approved proficiency test. Students who are already proficient in a second language may be eligible for a waiver of this requirement. Additional information on waivers can be found at the Office of Undergraduate Academic Affairs.
- Non-Western culture: 3 credits of an approved course in the study of a non-Western culture in addition to the course used to fulfill the university-wide general education requirement in global understanding. A course used to fulfill the university-wide general education global understanding requirement may not be simultaneously used to satisfy this college-level requirement. A course used to fulfill this requirement may be used simultaneously to fulfill any other requirements (university-wide general education requirements, college-level requirements, or requirements for the major). Additional information on waivers can be found at the Office of Undergraduate Academic Affairs.

This requirement may be fulfilled by the following courses:
Requirements for each major are listed in the departmental sections that follow.

**Bachelor of Science**

The BS degree provides students with a more intensive approach to the core technical questions of their majors. This curriculum has a reduced number of courses in humanities and social sciences in comparison with the BA degree to allow students to achieve greater depth in their majors. Students in Humanities and Social Sciences pursuing a BS must complete the university-wide general education program plus 1 additional credit of natural science (for a total of 8 credits), which must be fulfilled by an approved two-semester laboratory science sequence in a single science. This may not be fulfilled by BIOL 124 and 125.

Requirements for each major are listed in the departmental sections that follow.

**Transfer Students**

Admitted and enrolled transfer students who have completed an AA, AS, or AA&S degree from the Virginia Community College System (VCCS) and have been offered admission to Mason by the Office of Admissions may be eligible for a waiver of all George Mason University’s lower level general education requirements in accordance with the Guaranteed Admission Agreement. Students eligible for this waiver are still required by the university to complete English 302 and a synthesis course. Transfer students who have been offered admission under the terms of the Guaranteed Admission Agreement and are pursuing a degree in this college are considered to have met all college requirements except for proficiency in a foreign language (required of BA students).

**Policies for Graduate Students**

The college offers 16 master’s degrees plus a master of public administration and a master of fine arts in creative writing, and 11 doctoral degrees.

**Graduate Admission**

Admission decisions are made by the faculty committee of the respective graduate program. Denial of admission is not subject to appeal. Applicants denied admission to a program are not permitted to enroll in courses in that program.

If an applicant is offered graduate admission, the college reserves the right to withdraw that offer of admission if:

- During his or her academic studies, the admitted applicant has a significant drop in academic performance or fails to graduate with a degree prior to the first day of classes for the term admitted.
- There has been a misrepresentation in the application process.
Prior to the first day of classes for the term admitted, the college learns that the admitted applicant has engaged in behavior that indicates a serious lack of judgment or integrity, irrespective of the outcome of any disciplinary process related to such behavior.

For students admitted to an accelerated master's program, the student does not maintain satisfactory progress in his or her undergraduate program, does not receive a minimum grade of 3.00 in the graduate classes taken as an undergraduate, or otherwise does not meet the conditions specified on the application and admission letter.

The university further reserves the right to require the applicant to provide additional information (and/or authorization for the release of information) about any such matter.

**Provisional Admission**

Students provisionally admitted to their graduate degree program are not eligible to enroll in consortium course work or study at another institution until the conditions of the provisional contract have been met. Provisionally admitted students are also not eligible to participate in any study abroad programs until the conditions of the provisional contract have been met. Transfer of credit requests for course work taken in non-degree status at Mason or from another institution prior to admission will not be considered until the provisional contract has been fulfilled.

**Academic Load**

Graduate students can enroll in up to 12 credits of course work each semester. Non-degree students can enroll in up to 10 credits of course work each semester.

**Non-degree Enrollment**

Applicants who have been denied admission to a graduate certificate, master’s or doctoral program are not permitted to take graduate courses in that discipline as a non-degree student.

Graduate non-degree students may enroll in 500-, 600-, and 700-level courses. In exceptional cases graduate non-degree students in the College of Humanities and Social Sciences may request to enroll in an 800-level course if they have an appropriate academic or professional background and have the written permission of the course instructor, director of the graduate program offering the course, and the graduate dean.

**University Consortium**

Students should review university policies regarding the University Consortium under Special Registration Procedures in the Academic Policies chapter of this catalog.

Eligible students may enroll in courses at any of the institutions in the Consortium of Universities in the Washington Metropolitan area. Students are limited to one consortium course per semester, with a career maximum of 6 credits. To register for a consortium course, students must have an overall GPA of at least 3.00 and be in good academic standing. Students with grades of IN on their record or who earned grades of C or F in the most recent semester are not eligible to register for a consortium course. Students who have received a grade less than 3.00 in a consortium course are not permitted to enroll in additional consortium courses. Newly admitted graduate students are not permitted to enroll in consortium courses during their first semester of graduate study. Students who wish to enroll in consortium courses during their second semester of study must wait until the grades for the previous semester have been posted.

**Transfer of Credit**

To be eligible for transfer, credits must have been earned at an accredited graduate degree-granting institution (and applicable to a graduate degree at that institution) or at Mason while in non-degree status. Courses accepted for transfer credit must have been completed within six years of the admission term and with a minimum grade of 3.00. Courses with grades of P or S are not
accepted for transfer unless the official transcript indicates that the grade is equivalent to a 3.00 (B) or better. Some programs have more stringent standards on transfer of credit; students should contact their graduate program for specific information.

Credit from Other Institutions

Students must obtain all approvals, including course equivalencies, prior to enrolling in any course work at another institution. All appropriate paperwork must be submitted to the Office of the University Registrar by the last day to add during the academic term the course meets. Students enrolling in courses at other institutions with different drop/add timetables must still abide by Mason’s drop/add deadlines in terms of acquiring necessary approvals.

Dissertation Committee

The college follows university policies regarding dissertation committees. See Dissertation Committee in the Requirements for Doctoral Degrees section of the Academic Policies chapter of this catalog.

Dissertation (999) Registration

Doctoral students must be advanced to candidacy before they may enroll in 999. Students must register for 999 before the add deadline published in the Academic Calendar by the Office of the University Registrar. Once doctoral students begin registering for 999, they must enroll in at least 3 credits of 999 each semester (excluding summers) until they have completed the total number of dissertation credits required on their individual program of study. Once enrolled in 999, all doctoral students must maintain continuous enrollment in 999 until they deposit their approved dissertation in the University Library. If they have completed the number of dissertation credits required on their program of study, they may maintain continuous enrollment by registering for only 1 credit of 999. See Dissertation Registration in the Requirements for Doctoral Degrees section of the Academic Policies chapter of this catalog.

Time Limit for Doctoral Students

Total time to degree will not exceed eleven (11) calendar years from the time of first enrollment as a doctoral degree-seeking student in a program of the college. Doctoral students are expected to advance to candidacy in no more than six years and to complete all other degree requirements for graduation in no more than five years from the time of advancement to candidacy.

Students who will not meet published time limits because of circumstances beyond their control may petition for an extension. Extensions to the time limit for advancement to candidacy may be granted for a maximum period of one calendar year. The one-year extension granted to advance to candidacy will run concurrently with the five years provided to complete the dissertation so that the total time limit to degree will not exceed eleven (11) years even for those students granted a time extension for advancement to candidacy.

Students who are given permission to re-enroll following an absence from Mason may not count the time limits as beginning on the date of re-enrollment. Failure to meet the time limits or to secure approval of an extension request may result in termination from the program. International students attending in F-1 or J-1 status have more restrictive limits. Such students should contact the Office of International Programs and Services for further information.

Requests for extension of time limits must be submitted to the graduate dean in writing. They should explain the extenuating circumstances that prevented a timely completion of the degree and a timeline for completing the work within the limits of the extension. The request should include a letter from the student's graduate program director indicating program support for the extension and confirmation that the work can be completed within the limits of the extension.

Graduate Appeals of Dismissal or Termination
All graduate students should be familiar with the university polices on dismissal and termination as stated in Graduate Academic Standing section of the Academic Policies chapter of this catalog. Students who meet the criteria for dismissal or termination may submit a written appeal to the Office of Graduate Academic Affairs. Appeals should include all relevant information on the basis for appeal, as well as any appropriate documentation. Appeals of termination and dismissal are reviewed at the beginning of each semester by a faculty committee. The ruling of that committee represents the final decision of the college.

**Accelerated Master’s Degree Programs**

Many graduate programs in the College of Humanities and Social Sciences offer highly-qualified undergraduates the opportunity to apply to accelerated master’s degree programs. Students accepted into an accelerated master’s degree program obtain both a bachelor’s and a master’s degree after satisfactory completion of 144 - 150 credits (number of required credits depends on the degree program).

Students admitted to an accelerated master's degree program may use up to six graduate credits (courses at the 500 or 600 level) in partial fulfillment of requirements for the undergraduate degree. Upon completion and conferral of the undergraduate degree with satisfactory performance in graduate courses (minimum grade of 3.00 in each), students are given advanced standing in their master’s program.

Undergraduates may take a maximum of six additional graduate credits while undergraduates and mark them for reserve graduate credit. These credits are not used to fulfill undergraduate degree requirements but can be applied to the master’s degree. See the section on Graduate Course Enrollment by Undergraduates in the Academic Policies chapter of the catalog. Courses taken for reserve graduate credit must be approved in advance by the Office of Undergraduate Academic Affairs and the appropriate paperwork filed with the Office of the University Registrar.

Students must fulfill all other master’s degree requirements. For more information see Accelerated Master's Degree Programs.

The college offers accelerated master’s degrees in these disciplines:

- Anthropology
- English with a concentration in linguistics
- Global Affairs
- History
- Interdisciplinary Studies with a concentration in energy and sustainability
- Interdisciplinary Studies with a concentration in folklore studies
- Philosophy
- Political Science
- Psychology with a concentration in cognitive and behavioral neuroscience
- Public Administration
- Sociology

**Master's Degree**

**Middle East and Islamic Studies, MA (pending SCHEV approval)**

*Note: As of catalog publication in April, the program described below has been approved by the Board of Visitors and sent to the State Council for Higher Education in Virginia for consideration as a new degree program. The university cannot accept applications or enroll students in this program until SCHEV approval has been granted. Check the college/school web site for current program status.*
The interdisciplinary MA in Middle East and Islamic studies introduces students to the major methodological and theoretical issues and debates in the study of the Islamic tradition and Middle Eastern societies. Students study classical and contemporary topics from both regional and global perspectives.

The expressed goal of this program is to situate the study of the Middle East and Islam within a globalized world. Accordingly, the curriculum covers topics of recent scholarly significance including the new media, political Islam, the political economy of business-government networks, the relationship between “resource wars” and the “war on terrorism,” new diasporas and transnational Muslim communities in the ‘West,’ and the changed geopolitical environments of Muslim and Middle Eastern countries.

This interdisciplinary graduate degree prepares students for a variety of post-graduate opportunities in academia, government, and an expanding job market for people with this expertise.

Degree Requirements

Five core courses (15 credits)

- HIST 575 - Critical Issues and Debates in Islamic and Middle East Studies Credits: 3
- GOVT 500 - The Scientific Method and Research Design Credits: 3
- GOVT 733 - Political Islam Credits: 3
- RELI 591 - Special Topics in Religious Studies Credits: 3 (when topic is approaches to the study of Islam)
- HIST 751 - Research Seminar in Comparative World History Credits: 3

Five elective courses (15 credits)

Students should focus their electives around an area of interest and in preparation for the major research paper they will be required to produce in the core course HIST 751. Students who choose to write a thesis take 3 or 6 fewer elective credits.

In addition to the list below, elective courses may include special topics courses when relevant, directed readings and research, study abroad courses, and internships.

- ANTH 635 - Regional Ethnography Credits: 3 (when topic is people and cultures of the Middle East)
- CONF 749 - World Religions, Violence, and Conflict Resolution Credits: 1-3
- ENGH 665 - Texts in Global Contexts Credits: 3 (when topic is representing Islam or Arabic women writers)
- GOVT 530 - Comparative Politics Credits: 3
- GOVT 731 - Advanced Seminar in Comparative Politics Credits: 3
- HIST 510 - Approaches to Modern World History Credits: 3 (when topic is comparative world region methodology)
- HIST 535 - Problems in Comparative World History Credits: 3 (when topic is politics of historical memory)
- HIST 585 - Problems in Middle Eastern History Credits: 3 (when topic is revolution and state in Islam or tourism and travel in East and West)
- RELI 591 - Special Topics in Religious Studies Credits: 3 (when topic is Muslims in the United States)
- RELI 632 - World Religions in Conflict and Dialogue Credits: 3
• RELI 635 - World Religions in Transition and Transformation Credits: 3

Language proficiency

Students must demonstrate evidence of advanced professional competency in a second language (other than English) that is relevant to the Middle East or Islamic Studies. Evidence of language competency may be demonstrated through testing by Language Testing International.

Thesis (3 or 6 credits) (optional)

Students have an option of completing a thesis as part of their degree program. Students who choose the thesis option take 3 or 6 fewer credits of electives.

Total: 30 credits

Master's Level Certificate

Applied Conservation Science Graduate Certificate

Banner Code: LA-CERG-ACNS

Web: mccs.gmu.edu

The graduate certificate in applied conservation science provides students with hands-on education in conservation science. The courses in this program are all residential, full-day, one- or two-week intensive courses held at the Smithsonian Conservation Biology Institute in Front Royal, Virginia. This certificate is designed for early to mid-career conservation professionals working in government, non-governmental organizations, and research institutions worldwide.

Students acquire essential skills in conservation research and practice while developing a crucial understanding of the principles and philosophies underlying effective conservation and biodiversity programs. They learn how to apply analysis techniques and tools to address those questions and evaluate conservation outcomes.

Upon completion of the certificate, students will have developed practical and analytical skills applicable to a wide range of programs in applied conservation science research, policy, and practice -- from single-species protection and landscape-level restoration and management to community conservation initiatives and human-wildlife conflict mitigation.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in applied conservation science, see Application Requirements and Deadlines on the departmental web site.
Certificate requirements

Two core courses (6 credits)

- CONS 620 - Spatial Ecology, Geospatial Analysis & Remote Sensing for Conservation Credits: 3
- CONS 625 - Statistics for Ecology and Conservation Biology Credits: 3

One course (3 credits) in human dimensions chosen from:

- CONS 660 - Effective Conservation Leadership Credits: 3
- CONS 665 - Conservation Conflict Resolution Credits: 3

Electives (6 credits)

CONS 630 and 697 may be repeated for credit when topics are different.

- CONS 630 - Species Monitoring & Conservation Credits: 3
- CONS 660 - Effective Conservation Leadership Credits: 3 (if not used to fulfill human dimensions requirement)
- CONS 665 - Conservation Conflict Resolution Credits: 3 (if not used to fulfill human dimensions requirement)
- CONS 697 - Special Topics in Conservation Credits: 1-3

Total: 15 credits

African and African American Studies

Phone: 703-993-1201
Web: aaas.gmu.edu/

Faculty

Carbonneau, Carton, Cherubin, Clark, Dennis, Fauntroy, Fuchs, Haley, Johnson, Lepore, Levine, Manuel-Scott (director), Miller, Paden, Richards Jordan, Smith, Stewart, Travis, Weatherspoon

Course Work
The African and African American Studies Program offers all course work designated AFAM in the Courses chapter of this catalog.

**Undergraduate Programs**

The African and African American Studies Program offers an interdisciplinary minor open to students in all majors.

Students who pursue this minor examine the cultural, historical, economic, and political dimensions of people of African descent in America, the Caribbean, Africa, and throughout the Diaspora. Students learn theories and methodologies that are used to examine the complex dynamics of race, class, gender, and ethnicity in America. Through the coursework for this program, students develop critical and analytical approaches to societal issues because they are addressed through a variety of academic disciplines.

Students are encouraged to do an internship as part of the minor to further enhance their education and provide them with valuable preparation for the workforce.

**African American Studies Research and Resource Center**

The goal of the African American Studies Research and Resource Center (Paul Robeson Room) is to facilitate new ways for George Mason University students to learn about the African diaspora. As part of their academic and community involvements, students often need to address issues related to African and African American Studies. The center offers them opportunities for hands-on experience with African and African American life. It has been instrumental in assisting students, faculty, staff, and the community in finding resources to accomplish this goal.

The center sponsors a lecture series and a scholar-in-residence program and offers research and resources support for the Mason community.

**Undergraduate Interdisciplinary Minor**

**African and African American Studies Minor**

**Banner Code: AAMS**

Web: aaas.gmu.edu

In the minor students will examine the cultural, historical, economic, and political dimensions and experiences of people of African descent in America, the Caribbean, Africa, and throughout the Diaspora. Students will learn theories and methodologies that are used to examine the complex dynamics of race, class, gender, and ethnicity in America. Through this program students are able to develop critical and analytical approaches to societal issues because such issues are addressed and delineated through a variety of academic disciplines.

Students are encouraged to do an internship as part of the minor to further enhance their education and provide them with valuable preparation for the workforce.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

**Course Work**
Students pursuing the minor in African and African American Studies must complete a minimum of 15 credits with a minimum GPA of 2.00.

One required course (3 credits):

- AFAM 200 - Introduction to African American Studies Credits: 3

Four elective courses (12 credits) chosen from the list below:

Other courses, when relevant, may be able to meet this requirement with prior written approval of the director.

- AFAM 390 - Special Topics in African and African American Studies Credits: 3
- AFAM 490 - Internship Credits: 2-6
- AFAM 499 - Independent Study Credits: 1-3
- DANC 118 - World Dance Credits: 3 (May be applied to the minor when the topic is relevant to African and African American Studies.)
- ENGH 348 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGH 349 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGH 350 - African American Literature Through 1946 Credits: 3
- ENGH 351 - Contemporary African American Literature Credits: 3
- FREN 451 - Topics in Sub-Saharan Francophone Literature and Culture Credits: 3
- FREN 454 - Topics in Caribbean Francophone Literature and Culture Credits: 3
- GGS 325 - Geography of North Africa and the Middle East Credits: 3
- GOVT 464 - Issues in Public Policy and Administration Credits: 1-3
- HIST 130 - History of the Modern Global System Credits: 3
- HIST 261 - Survey of African History Credits: 3
- HIST 262 - Survey of African History Credits: 3
- HIST 335 - The African American Experience in the United States: African Background to 1885 Credits: 3
- HIST 336 - The African American Experience in the United States: Reconstruction to the Present Credits: 3
- HIST 466 - Origins of Conflict in Southern Africa Credits: 3
- SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
- SOCI 332 - The Urban World Credits: 3

Total: 15 credits

■ Criminology, Law and Society

Phone: 703-993-8315
Web: cls.gmu.edu

Faculty

Professors: Mastrofski, Taxman, Weisburd, Wilson (chair), Zingraff
Research professor: Turner

Associate professor: Gallagher, Johnson, Koper, Lumm, Willis

Assistant professors: Lawton, Merola, Portillo, Rudes

Assistant research professors: Trotman, James-Andrew

Term associate professor: Newmark

Term assistant professors: Voreas

Affiliate faculty: Uchida

Course Work

The Department of Criminology, Law and Society offers all course work designated CRIM in the Courses chapter of this catalog.

Undergraduate Programs

The BS in criminology, law and society provides students with a sound foundation in the liberal arts and a focused study of criminology, law and society. It also provides information concerning the social, human, and moral problems raised in the justice field. This major prepares students for careers in law enforcement, corrections, the courts, investigations, juvenile justice, private and homeland security, and related social and human services. It provides a strong background for law school and graduate study in criminal justice or law and society.

Honors in the Major

Highly qualified students may pursue advanced work leading to graduation with honors in the major. Students admitted to the honors program in the major take a two-course sequence CRIM 491 and 492. To graduate with honors in criminology, law and society, students must complete these courses with a minimum GPA of 3.50.

Internships

The department supports an active internship program, which places students in justice and police organizations throughout the Washington metropolitan area. Students can gain valuable work place experience while earning credit toward their degree.

Graduate Programs

The department offers a master's and a doctoral degree in criminology, law and society. These degrees draw on a strong multidisciplinary faculty who teach a wide range of courses in their specialties. These programs take advantage of Mason's proximity to the many justice organizations at the federal, state, and local levels. The curriculum is structured to give students the skills they need to do policy-relevant research. They will be able to work with local and national agencies concerned with justice and security to put those skills to use.

Funding
The department offers graduate teaching and research assistantships awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students awarded assistantships must register for a minimum of six credits a semester and, like all graduate students, show satisfactory progress toward their degree.

**Undergraduate Degree**

**Criminology, Law and Society, BS**

**Banner Code: LA-BS-CLS**

Web: cls.gmu.edu

This bachelor of science in criminology, law and society provides a sound foundation in the liberal arts and a focused study of the justice system and social, human, and moral problems raised in the justice field. The course of study prepares students for careers in law enforcement, corrections, the courts, investigations, juvenile justice, private and homeland security, and related social and human services. The program also provides a strong background for law school and graduate study in criminal justice or law and society.

Students may use up to 18 credits of approved ADJ courses taken at Northern Virginia Community College (NVCC) or comparable courses at another community college to fulfill the requirements detailed below. Once a student matriculates at Mason, no courses may be taken at another institution without prior written approval from the program and the dean.

This program of study is offered by the Department of Criminology, Law and Society.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

**Degree Requirements**

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BS in criminology, law and society must complete additional college requirements for the BS degree in the College of Humanities and Social Sciences.

Students pursuing this degree must complete 60 credits within the major, with a minimum GPA of 2.00.

**Five core courses (15 credits)**

- CRIM 100 - Introduction to Criminal Justice Credits: 3
- CRIM 306 - Criminal Justice Ethics Credits: 3
- CRIM 315 - Research Methods and Analysis in Criminology Credits: 3
- CRIM 424 - Constitutional Law: Criminal Process and Right Credits: 3
- CRIM 495 - Capstone in Criminology, Law and Society Credits: 3

**Skills for the justice professional courses (15 credits) chosen from:**
- CRIM 479 - Preparation for Internship Credits: 3
- CRIM 480 - Internship Credits: 6-12
- Any foreign language course that develops or requires foreign language skills and is taught in the language.
- Any CS course; any IT course; any FRSC course
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
- CONF 345 - Social Dynamics of Terrorism, Security, and Justice Credits: 3
- GGS 311 - Introduction to Geographic Information Systems Credits: 3
- GOVT 346 - American Security Policy Credits: 3
- GOVT 347 - International Security Credits: 3
- GOVT 364 - Public Policy Making Credits: 3
- GOVT 366 - Public Policy Analysis Credits: 3
- GOVT 452 - Administrative Law and Procedures Credits: 3
- PHIL 173 - Logic and Critical Thinking Credits: 3
- PHIL 311 - Philosophy of Law Credits: 3
- PSYC 405 - Mystery, Madness, and Murder Credits: 3
- SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
- SOCI 310 - Sociology of Deviance Credits: 3
- SOCI 315 - Women and Men in Society Credits: 3
- SOCI 405 - Analysis of Social Data Credits: 4
- SOCI 410 - Social Surveys and Attitude and Opinion Measurements Credits: 3
- SOCW 351 - Social Policy and Social Justice Credits: 3
- SOCW 370 - Social Policy Analysis and Advocacy Credits: 3
- SOCW 400 - Legal and Ethical Issues in Human Services Credits: 3
- SOCW 410 - Alcohol and Substance Abuse: Policies and Programs Credits: 3
- SOCW 415 - Child and Family Welfare Credits: 3
- STAT 350 - Introductory Statistics II Credits: 3
- STAT 362 - Introduction to Computer Statistical Packages Credits: 3
- STAT 455 - Experimental Design Credits: 3
- STAT 463 - Introduction to Exploratory Data Analysis Credits: 3
- STAT 474 - Introduction to Survey Sampling Credits: 3

Ten elective courses (30 credits) chosen from:

- CRIM 210 - Introduction to Criminology Credits: 3
- CRIM 220 - Introduction to Law and Society Credits: 3
- CRIM 230 - Introduction to Homeland Security Credits: 3
- CRIM 301 - Public Law and the Judicial Process Credits: 3 or GOVT 301 - Public Law and the Judicial Process Credits: 3
- CRIM 302 - Delinquency Credits: 3
- CRIM 304 - Computer Crime, Forensics, and Auditing Credits: 3 or IT 357 - Computer Crime, Forensics, and Auditing Credits: 3
- CRIM 305 - Crime and Crime Policy Credits: 3
- CRIM 307 - Social Inequality, Crime, and Justice Credits: 3
- CRIM 308 - Human Rights and Justice Credits: 3
- CRIM 310 - Introduction to Intelligence Analysis Credits: 3
Concentrations

Criminology, law and society majors have the option of obtaining a concentration by completing 15 of their 30 elective credits within one of the following areas. Credits earned in CRIM 490 may be applied to a concentration as appropriate for the content of the course, to be determined by the undergraduate director.

▲ Concentration in Criminal Justice (CJUS)

15 credits chosen from:

- CRIM 210 - Introduction to Criminology Credits: 3
- CRIM 302 - Delinquency Credits: 3
- CRIM 304 - Computer Crime, Forensics, and Auditing Credits: 3 or IT 357 - Computer Crime, Forensics, and Auditing Credits: 3
- CRIM 305 - Crime and Crime Policy Credits: 3
- CRIM 307 - Social Inequality, Crime, and Justice Credits: 3
- CRIM 400 - Applied Criminal Psychology Credits: 3
- CRIM 401 - Policing in America Credits: 3
- CRIM 402 - Punishment and Corrections Credits: 3
- CRIM 403 - Community Corrections Credits: 3
- CRIM 404 - Crime Victims and Victimization Credits: 3
- CRIM 408 - Criminal Courts Credits: 3
- CRIM 409 - Community Policing Credits: 3
• CRIM 425 - Criminal Justice Management Credits: 3
• CRIM 471 - Prevention and Deterrence of Crime Credits: 3

Total: 15 credits

▲ Concentration in Law and Society (LAWS)

15 credits chosen from:

• CRIM 220 - Introduction to Law and Society Credits: 3
• CRIM 301 - Public Law and the Judicial Process Credits: 3 or GOVT 301 - Public Law and the Judicial Process Credits: 3
• CRIM 308 - Human Rights and Justice Credits: 3
• CRIM 405 - Law and Justice around the World Credits: 3
• CRIM 406 - Family Law and the Justice System Credits: 3
• CRIM 407 - Advanced Topics in Law and Society Credits: 3
• CRIM 408 - Criminal Courts Credits: 3
• CRIM 422 - Controversial Legal Issues Credits: 3
• CRIM 423 - Constitutional Law: Civil Rights and Liberties Credits: 3 or GOVT 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
• CRIM 460 - Surveillance and Privacy in Contemporary Society Credits: 3

Total: 15 credits

▲ Concentration in Homeland Security and Justice (HSJ)

15 credits chosen from:

• CRIM 230 - Introduction to Homeland Security Credits: 3
• CRIM 310 - Introduction to Intelligence Analysis Credits: 3
• CRIM 405 - Law and Justice around the World Credits: 3
• CRIM 460 - Surveillance and Privacy in Contemporary Society Credits: 3
• CRIM 462 - Law Enforcement and Homeland Security Credits: 3
• CRIM 475 - Theory and Politics of Terrorism Credits: 3

Total: 15 credits

Total: 60 credits
Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in criminology, law and society fulfill this requirement by successfully completing CRIM 495. Students should complete ENGH 302 before taking the writing-intensive course in the major or take the two courses simultaneously.

Undergraduate Minor

Criminology, Law and Society Minor

Banner Code: CLS
Web: cls.gmu.edu

Through the minor in criminology, law and society, students develop knowledge of the principles, institutions, and practices of the systems for administering justice. It provides a solid foundation for students seeking to supplement their major area of study, to develop knowledge and skills needed for justice-related occupations, or to lay the foundation for possible law school or graduate study in the justice field. Students obtain an overview of the justice system and develop advanced knowledge of selected features of the justice system.

Students should plan their course of study with a criminology, law and society faculty advisor assigned by the program. The minor must be approved by the director before graduation.

This program of study is offered by the Department of Criminology, Law and Society.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 15 credits in criminology, law and society with a minimum GPA of 2.00.

One required course (3 credits)

- CRIM 100 - Introduction to Criminal Justice Credits: 3

Four courses (12 credits) in upper-level CRIM courses

CRIM 479 and CRIM 480 may not be used to fulfill this requirement.

Total: 15 credits
Intelligence Analysis Minor

Banner Code: NTLA

Web: cls.gmu.edu

The minor in intelligence analysis is designed for students who are interested in careers in homeland security or other intelligence-related fields. This minor focuses on developing the skills of intelligence analysis, including research, writing, briefing, and analytical tradecraft. Students explore ethical issues in the field and new developments in the analysis of intelligence information.

The curriculum fosters a broad knowledge of content in several disciplines valued by employers in homeland security and intelligence-related fields. The minor offers students sufficient flexibility to pursue their primary interests while also preparing themselves for careers in intelligence analysis.

Students who are American citizens may apply for an internship in intelligence analysis at the Federal Bureau of Investigation. Credits earned for the internship are in addition to those required for the minor and are not required for completion of the minor. Students who intend to apply for the internship should begin the application process no later than September of their sophomore year, since the security clearance process can take a year or more. Students in this minor are strongly encouraged to pursue advanced training in Arabic, Chinese, or Russian.

This program of study is offered by the Department of Criminology, Law and Society but is multidisciplinary in nature and requires coursework from at least two different academic departments.

Students should plan their course of study with a criminology, law and society faculty advisor assigned by the program. The minor must be approved by the director before graduation.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18-19 credits with a minimum GPA of 2.0.

Two required courses (6-7 credits)

- CRIM 310 - Introduction to Intelligence Analysis Credits: 3
- CRIM 315 - Research Methods and Analysis in Criminology Credits: 3 or GOVT 300 - Research Methods and Analysis Credits: 4

Four elective courses (12 credits) chosen from:

The electives must consist of courses from at least two different departments (two different subject prefixes).

- CONF 345 - Social Dynamics of Terrorism, Security, and Justice Credits: 3
- CRIM 230 - Introduction to Homeland Security Credits: 3
- CRIM 304 - Computer Crime, Forensics, and Auditing Credits: 3
  or
- IT 357 - Computer Crime, Forensics, and Auditing Credits: 3
- CRIM 400 - Applied Criminal Psychology Credits: 3
- CRIM 460 - Surveillance and Privacy in Contemporary Society Credits: 3
- CRIM 462 - Law Enforcement and Homeland Security Credits: 3
- CRIM 475 - Theory and Politics of Terrorism Credits: 3
- GGS 311 - Introduction to Geographic Information Systems Credits: 3
- GGS 412 - Air Photography Interpretation Credits: 3
- GGS 416 - Satellite Image Analysis Credits: 3
- GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
- GOVT 333 - Government and Politics of Asia Credits: 3
- GOVT 334 - Government and Politics of Europe Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
- GOVT 340 - Central Asian Politics Credits: 3
- GOVT 341 - Chinese Foreign Policy Credits: 3
- GOVT 345 - Political Islam Credits: 3
- GOVT 346 - American Security Policy Credits: 3
- GOVT 347 - International Security Credits: 3
- GOVT 460 - Surveillance and Privacy in Contemporary Society Credits: 3
- HIST 329 - Modern Russia and the Soviet Union Credits: 3
- HIST 354 - Modern China Credits: 3
- HIST 460 - Modern Iran Credits: 3
- HIST 461 - Arab-Israeli Conflict Credits: 3
- HIST 465 - The Middle East in the 20th Century Credits: 3
- SOCI 320 - Social Structure and Globalization Credits: 3
- SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
- STAT 350 - Introductory Statistics II Credits: 3

Total: 18-19 credits

Master's Degree

Criminology, Law and Society, MA

Banner Code: LA-MA-CLS

Web: cls.gmu.edu

The MA in criminology, law and society brings cutting edge social science methods to the disciplines of criminology and law and society. The program is designed for students who seek to make a difference in the development and evaluation of policy in these fields. The MA program provides students with enhanced skills in analysis and policy evaluation for their further career development or to help them prepare for competitive, sought-after positions.
The program draws on a multidisciplinary departmental faculty for required core courses and electives. Students can also take a wide range of other electives from different university programs, including those in computational social science, conflict analysis and resolution, economics, government, law, philosophy, psychology, public administration, sociology, and statistics.

The program takes advantage of the university’s proximity to many justice organizations at the federal, state, and local levels in the capital region. The curriculum is structured to give students the skills to do policy-relevant research and work with justice and security agencies in the region to exercise those skills and serve the needs of those agencies.

This program of study is offered by the Department of Criminology, Law and Society.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Transfer Credits**

Students may request to transfer a maximum of 12 credits for prior graduate course work (not applied to a previous degree) subject to approval by the graduate director and dean and in accordance with the Academic Policies chapter of this catalog.

**Satisfactory Progress**

Each new student is assigned a faculty advisor who helps develop a program of study. The advisor and faculty assess the progress of all students annually. Students who fail to make satisfactory progress may be terminated from the program. Satisfactory progress in the MA in criminology, law and society is defined as maintaining a minimum GPA of 3.00 with the minimum grade of B- in all courses. As in all graduate programs, students who receive a grade below B- will receive an academic warning the first time and a letter of dismissal the second time.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in criminology, law and society, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

In addition to satisfying the requirements for all master's degrees as stated in the Academic Policies section of the catalog, students pursuing a master's degree in criminology, law and society must successfully complete 30-credits of required course work.

Students intending to pursue a doctoral degree and academic or research career should complete the requirements for the MA in Criminology, Law and Society with thesis. For those students interested in careers in justice and security organizations a concentration in practice and policy is offered. This concentration does not require the completion of a thesis.

**Four core courses (12 credits) in three fields**

**Justice and law**

- CRIM 700 - Theories of Justice Credits: 3
• CRIM 720 - Behavior of Law Credits: 3

Justice organizations, administration, and leadership

• CRIM 740 - Justice Organization and Administration Credits: 3

Crime and crime policy

• CRIM 760 - Crime and Crime Policy Credits: 3

Three courses (9 credits) of analytic methods

• CRIM 780 - Research Methods Credits: 3
• CRIM 782 - Statistics I Credits: 3
• CRIM 783 - Statistics II Credits: 3

One to two elective courses (3 to 6 credits)

Students choose electives from courses in one or more of the substantive fields of study listed below.

Thesis (3 to 6 credits)

Students can apply a maximum of 6 credits of thesis to the degree. A thesis proposal must be submitted to the graduate director prior to registering for thesis credits. The master’s thesis must be defended orally before a committee of three faculty appointed by the graduate director. Students who do a 3-credit thesis will have 6 credits of electives.

Students must follow the thesis enrollment policy of the university and once enrolled in CRIM 799, maintain continuous enrollment as specified in the Academic Policies chapter of the catalog.

• CRIM 799 - Master’s Thesis Credits: 1-6

Total: 30 credits

▲Concentration in Policy and Practice (PAP)
This concentration is intended for students planning careers in justice and security organizations following completion of the MA degree and does not include a thesis requirement.

Four core courses (12 credits) in three fields

Justice and law

- CRIM 720 - Behavior of Law Credits: 3

Justice organizations, administration, and leadership

- CRIM 740 - Justice Organization and Administration Credits: 3
- CRIM 742 - Leadership in Justice and Security Organizations Credits: 3

Crime and crime policy

- CRIM 760 - Crime and Crime Policy Credits: 3

Two courses (6 credits) of analytic methods

- CRIM 780 - Research Methods Credits: 3
- CRIM 781 - Justice Program Evaluation Credits: 3

Capstone Practicum (3 credits)

- CRIM 790 - Research Practicum Credits: 1-6

Three elective courses (9 credits)

Students choose electives from courses in three or more of the substantive fields of study listed below.

Total: 30 credits
Substantive Fields of Study

Master’s students are required to take one to three electives within the substantive fields of study below. One non-CRIM elective course may be taken. Students may use other courses as elective credit for a substantive field with prior written approval of the student’s advisor, director of the graduate program, and the sponsoring program.

Justice and Law

Justice-related electives:

- CRIM 702 - Comparative Justice Credits: 3
- CRIM 703 - Restorative Justice Credits: 3
- CRIM 795 - Special Topics Credits: 3
- GOVT 520 - Political Theory Credits: 3
- GOVT 725 - Democratic Theory Credits: 3
- GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3
- SOCI 619 - Conflict and Conflict Management: Perspectives from Sociology Credits: 3
- SOCI 640 - Social Theory and Social Policy Credits: 3
- SOCI 711 - Classical Sociological Theory Credits: 3
- SOCI 712 - Contemporary Sociological Theory Credits: 3
- CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3
- CONF 701 - Theories of Social Harmony Credits: 3
- CONF 720 - Ethnic and Cultural Factors in Conflict Resolution Credits: 3-3
- CONF 721 - Conflict and Race Credits: 3
- CONF 723 - Conflict and Gender Credits: 3
- CONF 726 - Moral and Philosophical Foundations of Conflict Credits: 3
- CONF 747 - Reconciliation Credits: 3
- CONF 802 - Theories of the Person Credits: 3
- CONF 803 - Structural Theories Credits: 3
- ECON 611 - Microeconomic Theory Credits: 3
- ECON 852 - Public Choice I Credits: 3
- ECON 854 - Public Choice II Credits: 3

Law-related electives:

- Any selected LAW courses. Enrollment requires successful completion of CRIM 720 and 721 and approval from the department coordinator, law school instructor, and associate dean for student academic affairs of the Law School.
- CRIM 721 - The Constitution, Criminal Procedure, and Security Credits: 3
- CRIM 722 - Civil Justice Credits: 3
- CRIM 723 - Law and Social Control Credits: 3
- CRIM 730 - Courts and Constitutional Law Credits: 3
- CRIM 795 - Special Topics Credits: 3
- SOCI 503 - Sociology of Law Credits: 3
Justice Organizations, Administration, and Leadership

- CRIM 509 - Justice Organizations and Processes Credits: 3
- CRIM 510 - Policing in a Democratic Society Credits: 3
- CRIM 691 - Justice Program Planning and Implementation Credits: 3
- CRIM 741 - Conduct of Justice Organizations at the Street Level Credits: 3
- CRIM 742 - Leadership in Justice and Security Organizations Credits: 3
- CRIM 743 - Changing Justice and Security Organizations Credits: 3
- CRIM 749 - Issues in Justice Administration Credits: 1-3
- CRIM 795 - Special Topics Credits: 3
- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 621 - Principles and Practices in Government Organization and Management Credits: 3
- PUAD 622 - Program Planning and Implementation Credits: 3
- PUAD 661 - Public Budgeting Systems Credits: 3
- PUAD 671 - Public Employee Labor Relations Credits: 3
- PUAD 680 - Managing Information Resources Credits: 3
- PUAD 700 - Ethics and Public Administration Credits: 3
- PUAD 727 - Seminar in Risk Assessment and Decision Making Credits: 3
- PUAD 781 - Information Management: Technology and Policy Credits: 3
- CONF 731 - Conflict in Organizations Credits: 3
- CONF 741 - Negotiations Credits: 3
- CONF 743 - Dynamics of Conflict Termination Credits: 3
- PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
- PSYC 639 - Survey of Organizational Processes Credits: 3
- SOCI 605 - Gender and Social Structure Credits: 3
- SOCI 623 - Racial and Ethnic Relations: American and Selected Global Perspectives Credits: 3

Crime and Crime Policy

- CRIM 761 - Politics of Crime Policy Credits: 3
- CRIM 795 - Special Topics Credits: 3
- SOCI 607 - Criminology Credits: 3
- GOVT 745 - International Security Credits: 3
- PUAD 644 - Public Policy Models Credits: 3
- PSYC 617 - Child Psychopathology Credits: 3

Doctoral Degree

Criminology, Law and Society, PhD
The PhD program in criminology, law and society is designed to produce top academic scholars and leaders in policy and applied settings. It brings cutting edge social science methods to the disciplines of criminology and law and society. Students coming to this program seek to make a difference in the development and evaluation of policy in these fields. The goal of this program is to provide a rigorous course of study that will prepare students to do research, teach, develop and test policies, and administer agencies and programs designed to administer law, deliver justice, reduce crime, and enhance domestic security.

The program draws on a multidisciplinary departmental faculty to teach the required core courses and electives. Students can also take a wide range of other electives from many other university faculty including those in computational social science, conflict analysis and resolution, economics, government, law, philosophy, psychology, public administration, sociology, and statistics. The program takes advantage of the university’s proximity to many justice organizations at the federal, state, and local levels in the capital region. The curriculum is structured to give students the skills to do policy-relevant research and work with justice and security agencies in the region to exercise those skills and serve the needs of those agencies.

This program of study is offered by the Department of Criminology, Law and Society.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the PhD in criminology, law and society, see Application Requirements and Deadlines on the departmental web site.

Master's Degree

Students admitted to the doctoral program without a master's degree need to earn the MA in criminology, law and society. The requirements for the MA degree are included in the requirements for the PhD listed below. When beginning the doctoral program students should add the master's degree as a secondary program using the Secondary Program Application and then apply online to graduate the semester prior to meeting all requirements for the master's degree.

Reduction of Credit

Students entering the doctoral program with a master’s degree in a related discipline, including a law degree, may request that the required credits for the doctoral degree be reduced by a maximum of 24 credits with approval of the graduate director and dean and in accordance with university policy. Students who have prior graduate course work that has not been applied to another degree may request to have a maximum of 12 of these graduate credits transferred to their degree program, with approval of the graduate director and dean and in accordance with university policy.

Satisfactory Progress

Each new student is assigned an advisor who helps develop a program of study. The program of study must be submitted by the end of the first year. On advancement to candidacy, the chair of the dissertation committee becomes the advisor. The advisor and faculty assess the progress of all students annually. Students who fail to make satisfactory progress may be terminated from the program or dismissed from the university. Satisfactory progress in the PhD in criminology, law and society is defined as maintaining a minimum GPA of 3.00 with the minimum grade of B- in all courses. As in all graduate programs, students who receive a grade below B- will receive an academic warning the first time and a letter of dismissal the second time.
Degree Requirements

In addition to satisfying the requirements for all doctoral degrees, students must successfully complete 72 credits of required course work, pass two qualifying exams, and form a dissertation committee, after which they are advanced to candidacy. The final requirement is a dissertation of original research representing a significant contribution to the field, which should be publishable in a referred journal or a quality press.

Four core substantive courses (12 credits)

- CRIM 700 - Theories of Justice Credits: 3
- CRIM 720 - Behavior of Law Credits: 3
- CRIM 740 - Justice Organization and Administration Credits: 3
- CRIM 760 - Crime and Crime Policy Credits: 3

Four analytical methods courses (12 credits)

- CRIM 780 - Research Methods Credits: 3
- CRIM 782 - Statistics I Credits: 3
- CRIM 783 - Statistics II Credits: 3

and one course chosen from:

- CRIM 781 - Justice Program Evaluation Credits: 3
- SOCI 631 - Survey Research Credits: 3
- SOCI 632 - Evaluation Research for Social Programs Credits: 3
- SOCI 634 - Qualitative Research Methods Credits: 3
- STAT 574 - Survey Sampling I Credits: 3
- STAT 658 - Time Series Analysis and Forecasting Credits: 3
- STAT 662 - Multivariate Statistical Methods Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3
- STAT 674 - Survey Sampling II Credits: 3
- PSYC 633 - Evaluative Research in Psychology Credits: 3
- PSYC 640 - Techniques in Industrial/Organizational Psychology Credits: 3
- CSS 600 - Introduction to Computational Social Science Credits: 3
- CSS 610 - Computational Analysis of Social Complexity Credits: 3
- CRIM 795 - Special Topics Credits: 3

Six courses (18 credits) in two substantive fields of study:

Students select two substantive fields and complete three courses within each. Students may take one non-CRIM elective course in each area or other courses in criminology, law and society with prior written approval of the director of the graduate program.
Justice and Law

Justice-related electives:

- CRIM 702 - Comparative Justice Credits: 3
- CRIM 703 - Restorative Justice Credits: 3
- CRIM 795 - Special Topics Credits: 3
- GOVT 520 - Political Theory Credits: 3
- GOVT 725 - Democratic Theory Credits: 3
- GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3
- SOCI 619 - Conflict and Conflict Management: Perspectives from Sociology Credits: 3
- SOCI 640 - Social Theory and Social Policy Credits: 3
- SOCI 711 - Classical Sociological Theory Credits: 3
- SOCI 712 - Contemporary Sociological Theory Credits: 3
- CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3
- CONF 701 - Theories of Social Harmony Credits: 3
- CONF 720 - Ethnic and Cultural Factors in Conflict Resolution Credits: 1-3
- CONF 721 - Conflict and Race Credits: 3
- CONF 723 - Conflict and Gender Credits: 3
- CONF 726 - Moral and Philosophical Foundations of Conflict Credits: 3
- CONF 747 - Reconciliation Credits: 3
- CONF 802 - Theories of the Person Credits: 3
- CONF 803 - Structural Theories Credits: 3
- ECON 611 - Microeconomic Theory Credits: 3
- ECON 852 - Public Choice I Credits: 3
- ECON 854 - Public Choice II Credits: 3

Law-related electives:

- Any selected LAW courses. Prerequisite for enrollment in LAW courses: successful completion of CRIM 720 and 721. Enrollment requires preapproval from the graduate director, law school instructor, and associate dean for student academic affairs of the Law School.
- CRIM 721 - The Constitution, Criminal Procedure, and Security Credits: 3
- CRIM 722 - Civil Justice Credits: 3
- CRIM 723 - Law and Social Control Credits: 3
- CRIM 730 - Courts and Constitutional Law Credits: 3
- CRIM 795 - Special Topics Credits: 3
- SOCI 503 - Sociology of Law Credits: 3
- PHIL 611 - Philosophy of Law Credits: 3
- CONF 733 - Law and Justice from a Conflict Perspective Credits: 1-3
- ECON 895 - Special Topics in Economics Credits: 3

Justice Organizations, Administration, and Leadership
• CRIM 509 - Justice Organizations and Processes Credits: 3
• CRIM 510 - Policing in a Democratic Society Credits: 3
• CRIM 691 - Justice Program Planning and Implementation Credits: 3
• CRIM 741 - Conduct of Justice Organizations at the Street Level Credits: 3
• CRIM 742 - Leadership in Justice and Security Organizations Credits: 3
• CRIM 743 - Changing Justice and Security Organizations Credits: 3
• CRIM 749 - Issues in Justice Administration Credits: 1-3
• CRIM 795 - Special Topics Credits: 3
• PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
• PUAD 621 - Principles and Practices in Government Organization and Management Credits: 3
• PUAD 622 - Program Planning and Implementation Credits: 3
• PUAD 661 - Public Budgeting Systems Credits: 3
• PUAD 671 - Public Employee Labor Relations Credits: 3
• PUAD 680 - Managing Information Resources Credits: 3
• PUAD 700 - Ethics and Public Administration Credits: 3
• PUAD 727 - Seminar in Risk Assessment and Decision Making Credits: 3
• PUAD 781 - Information Management: Technology and Policy Credits: 3
• CONF 731 - Conflict in Organizations Credits: 3
• CONF 741 - Negotiations Credits: 3
• CONF 743 - Dynamics of Conflict Termination Credits: 3
• PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
• PSYC 639 - Survey of Organizational Processes Credits: 3
• SOCI 605 - Gender and Social Structure Credits: 3
• SOCI 623 - Racial and Ethnic Relations: American and Selected Global Perspectives Credits: 3

Crime and Crime Policy

• CRIM 761 - Politics of Crime Policy Credits: 3
• CRIM 795 - Special Topics Credits: 3
• SOCI 607 - Criminology Credits: 3
• GOVT 745 - International Security Credits: 3
• PUAD 644 - Public Policy Models Credits: 3
• PSYC 617 - Child Psychopathology Credits: 3

Electives (6-15 credits)

Students complete the remaining 72 credits through additional elective courses relevant to criminology, law and society in consultation with their advisor. Students may have more than 6 credits of electives, depending on the number of dissertation credits required by their program of study.

One professionalization course (0 credits)

• CRIM 797 - Professionalization Seminar Credits: 0
Qualifying Exams

Students must pass written qualifying exams in two core substantive fields of the student’s choosing, selected from the three fields above. Students may take a single qualifying exam at each sitting.

Students are not eligible to take the qualifying exams until they have successfully completed the required course work, as well as course work in the substantive area in which they intend to sit for the qualifying exam. Students have one opportunity across both exam areas to retake a failed exam.

Dissertation (15-24 credits)

Once enrolled in 998, students in this degree program must maintain continuous registration in 998 or 999 each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students may apply to this degree a minimum of 3 and a maximum of 6 credits of 998 and a minimum of 12 and a maximum of 21 credits of 999. They may apply a maximum of 24 dissertation credits (998 and 999 combined) to the degree. Because of the continuous registration policy, students may be required to register for additional credits of these courses. Students who take fewer than 24 dissertation credits will have accordingly more elective credits.

- CRIM 998 - Doctoral Dissertation Proposal Credits: 1-6
- CRIM 999 - Doctoral Dissertation Research Credits: 1-21

Total: 72 credits

Advancement to Candidacy

To advance to candidacy, students must complete all course work required on their approved program of study. Students must also successfully complete and pass two qualifying exams. In addition, students must have a dissertation committee appointed by the Dean’s Office and have defended their dissertation proposal.

Dissertation Committee

The student’s committee is composed of at least three faculty members and a chair, at least two of whom must be full-time CLS faculty and one, a member of the graduate faculty outside CLS. The chair must be a full-time CLS faculty member.

Communication

Phone: 703-993-1090
Web: communication.gmu.edu

Faculty
Professors: Boileau, Botan, Decker, Friedley, Kreps (chair), Lichter, Lont, Maibach, Priest-Hornig, Rowan

Emeritus professors: Friedley, Looney, Manchester, McAuley, Taylor

Associate professors: Cai, Gibson, Muir, Nicotera (associate chair), Villagran

Assistant professors: Craig, Fisher, Hopson, Vraga, Zhao

Term professor: Pober

Term associate professor: Finn

Term assistant professors: Bedore, Wright

Term research assistant professor: Roser-Renouf

Term instructors: M. Dickerson, Hodgson, Klein, Miller, Samoilenko, Schmeidler, Simpson, R. Smith, Tomasovic


Affiliate: J. R. Censer

Course Work

The Communication Department offers all course work designated COMM in the Courses chapter of this catalog.

Undergraduate Programs

The department offers a BA in communication, which prepares students for graduate study or entry-level positions in such fields as interpersonal and organizational communication, journalism, media production and criticism, persuasive and political communication, and public relations.

Students majoring in communication complete a concentration from one of these areas: interpersonal and organizational communication, journalism, media production and criticism, persuasive and political communication, or public relations.

Internships

The department has an active internship program. Many students include an internship during their senior year as a way of gaining practical experience with national and international businesses, associations, or government agencies.

Student Activities

All students are encouraged to participate in one of the communication activities: Broadside, debate, forensics, GMView, Mason Cable Network, PRSSA, or WGMU.

Honors in the Major
Highly qualified students may pursue advanced work leading to graduation with honors in the major. Communication majors are eligible to apply if they have completed 90 credit hours (including COMM 200 and two of COMM 300, 301, 302, 305), have a minimum GPA of 3.25 in all coursework completed at George Mason, and a minimum GPA of 3.50 in all communication coursework completed at George Mason and applied to the major.

If accepted, students take a two-course sequence, COMM 490 and 491. COMM 490 replaces COMM 400 in the degree requirements for the major in communication. To graduate with honors in the major, students must complete 490 and 491 with a minimum GPA of 3.50 and maintain a GPA of 3.50 in the major and 3.25 overall.

Minors

The department offers minors in communication, electronic journalism, and sport communication. The latter is offered jointly by the Department of Communication and the School of Recreation, Health, and Tourism in the College of Education and Human Development. The department faculty also participate in these minors: Film and Media Studies Minor, Multimedia Minor, Consciousness and Transformation Minor, and Women and Gender Studies Minor.

Students majoring in communication may choose to minor in any discipline that offers an undergraduate minor.

Graduate Programs

The department offers a MA and a PhD in communication with three major areas of emphasis: strategic communication, health communication, and science communication. The programs provide students with a strong foundation in communication theory and research while at the same time encouraging students to apply their skills in the public, private, and nonprofit sectors.

The faculty in strategic communication, drawing on their expertise in organizational, public relations, and political communication theory and research, teach courses on planning, developing, executing, and evaluating public communication campaigns and interventions. Faculty in health communication teach courses which explore the relationship between communication practices and the health and well-being of individuals and communities. This includes how to improve cooperation and coordination between health care providers and consumers, how to effectively utilize health information technologies, and how to develop influential health promotion campaigns. The faculty in science communication offer courses designed to improve students’ knowledge of the particular challenges involved in making science and technology understandable to a variety of audiences, as well as exploring solutions to those challenges. Science communicators work in media and in other organizations and agencies involved in promoting and disseminating science, as well as facilitating public engagement in considering science-related issues.

Strategic, health, and science communication and health communication are three of the most rapidly expanding specialties within the broad field of communication. Graduates of these programs find a very welcoming employment market for their expertise.

Funding

The department offers teaching and research assistantships, which are awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students awarded assistantships must register for a minimum of six credits a semester and show satisfactory progress toward their degree.

Undergraduate Degree

Communication, BA
The bachelor of arts in communication prepares students for graduate study or entry-level positions in such fields as interpersonal and organizational communication, journalism, media production and criticism, persuasive and political communication, and public relations.

This program of study is offered by the Department of Communication.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in communication must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 36 credits with a minimum grade of 2.00 in each course.

Of the 36 credits applied to the BA in communication, at least 3 must be in a course designated presentation-intensive; there is a list of such courses at the end of this section. Of the 18 credits of concentration (12 credits) and electives (6 credits), at least 12 credits must be at the 300-400 level and no more than 6 credits may be in COMM 450 - Internship.

Of the 120 credits applied to a degree, no more than 9 credits may be from an internship and no more than 10 credits may be from courses listed at the end of this degree description.

Six required courses (18 credits) in communication

Students must complete COMM 200 with a grade of C (2.00) or better before enrolling in COMM 300, 301, or 302. Students then have to complete two of COMM 300, 301, 302, and 305 with a grade of C (2.00), before enrolling in COMM 400.

- COMM 200 - Communication Theory Credits: 3
- COMM 300 - Foundations of Public Communication Credits: 3
- COMM 301 - Foundations of Interpersonal Communication Credits: 3
- COMM 302 - Foundations of Mass Communication Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- COMM 400 - Research Methods in Communication Credits: 3

Elective courses in communication (6 credits)

Students choose any COMM course in consultation with an advisor keeping in mind the limitations that apply to the whole degree (no more than 9 credits may be from an internship [COMM 450 or GOVT 450] and no more than 10 credits may be from courses listed at the end of this section).

One approved concentration (12 credits)

Students complete one concentration. They must declare their concentration before they earn more than 75 credits. Transfer students with 60 or more credits are encouraged to declare a concentration by the end of their first semester. COMM 399 - Special Topics in Communication may be applied toward a concentration when the topic is relevant to the concentration with prior written approval of the undergraduate director.
▲ Concentration in Interpersonal and Organizational Communication (IOC)

One required course (3 credits)

- COMM 335 - Organizational Communication Credits: 3

9 credits chosen from:

- COMM 201 - Small Group Communication Credits: 3
- COMM 230 - Case Studies in Persuasion Credits: 3
- COMM 304 - Foundations of Health Communication Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- COMM 332 - Nonverbal Communication Credits: 3
- COMM 344 - Parliamentary Procedure Credits: 1
- COMM 401 - Interpersonal Communication in the Workplace Credits: 3
- COMM 430 - Persuasion Credits: 3
- COMM 433 - Environmental Communication Credits: 3
- COMM 434 - Interviewing Credits: 3
- COMM 465 - Topics in Communication and Gender Credits: 3

Total: 12 credits

▲ Concentration in Journalism (JNL)

Two required courses (6 credits):

- COMM 303 - Writing across the Media Credits: 3
  and
- COMM 351 - News Writing and Reporting Credits: 3 or COMM 352 - News Editing: Print and Beyond Credits: 3

6 credits chosen from:

- COMM 145 - Newspaper Workshop I Credits: 1
• COMM 157 - Video Workshop Credits: 1
• COMM 203 - Introduction to Journalism Credits: 3
• COMM 330 - Principles of Public Relations Credits: 3
• COMM 345 - Newspaper Workshop II Credits: 1
• COMM 351 - News Writing and Reporting Credits: 3 (if not taken as a required course)
• COMM 352 - News Editing: Print and Beyond Credits: 3 (if not taken as a required course)
• COMM 353 - Broadcast Journalism Credits: 3
• COMM 356 - Video: Performance and Writing Credits: 3
• COMM 361 - Online Journalism Credits: 3
• COMM 370 - Feature Writing Credits: 3
• COMM 371 - Sports Writing and Reporting Credits: 3
• COMM 373 - Business and Economic Journalism Credits: 3
• COMM 374 - Political Journalism Credits: 3
• COMM 391 - Writing for Public Relations Credits: 3
• COMM 453 - Electronic News Gathering and Editing Credits: 3
• COMM 454 - Free Speech and Ethics Credits: 3
• COMM 455 - History of Print Journalism Credits: 3
• COMM 475 - Journalism Law Credits: 3

Total: 12 credits

▲ Concentration in Media Production and Criticism (MPC)

One required course (3 credits)

• COMM 380 - Media Criticism Credits: 3

9 credits chosen from:

• COMM 148 - Radio Workshop I Credits: 1
• COMM 157 - Video Workshop Credits: 1
• COMM 202 - Media and Society Credits: 3
• COMM 210 - Voice and Articulation Credits: 3
• COMM 255 - Introduction to Media Literacy Credits: 3
• COMM 303 - Writing across the Media Credits: 3
• COMM 348 - Radio Workshop II Credits: 1
• COMM 350 - Mass Communication and Public Policy Credits: 3
• COMM 354 - Radio Production Credits: 3
• COMM 355 - Video Principles and Practices Credits: 3
• COMM 356 - Video: Performance and Writing Credits: 3
• COMM 358 - Video Producing and Directing Credits: 3
• COMM 359 - Media Management Credits: 3
• COMM 363 - Media Career Seminar Credits: 1
• COMM 365 - Gender, Race, and Class in the Media Credits: 3
• COMM 366 - Visual Communication Credits: 3
• COMM 375 - Mass Communication Advertising and Promotions Credits: 3
• COMM 456 - Comparative Mass Media Credits: 3

Total: 12 credits

▲ Concentration in Persuasive and Political Communication (PPC)

Two required courses (6 credits)

Created required courses for concentration in persuasive and political communication

• COMM 430 - Persuasion Credits: 3
• COMM 434 - Interviewing Credits: 3

Two courses (6 credits) chosen from:

• COMM 140 - Forensics Seminar in Creative Arts Credits: 1
• COMM 141 - Forensics Seminar in Recreative Arts Credits: 1
• COMM 142 - Forensics Seminar in Debate: Affirmative Strategies Credits: 1
• COMM 143 - Forensics Seminar in Debate: Negative Strategies Credits: 1
• COMM 230 - Case Studies in Persuasion Credits: 3
• COMM 260 - Basic Debate Theory and Practice Credits: 3
• COMM 261 - Theories of Argumentation Credits: 3
• COMM 320 - Business and Professional Communication Credits: 3
• COMM 326 - Rhetoric of Social Movements and Political Controversy Credits: 3
• COMM 340 - Forensics Seminar in Creative Arts Credits: 1
• COMM 341 - Forensics Seminar in Recreative Arts Credits: 1
• COMM 342 - Forensics Seminar in Debate: Affirmative Strategies Credits: 1
• COMM 343 - Forensics Seminar in Debate: Negative Strategies Credits: 1
• COMM 362 - Argument and Public Policy Credits: 3
• COMM 374 - Political Journalism Credits: 3
• COMM 380 - Media Criticism Credits: 3
• COMM 412 - Politics and the Mass Media Credits: 3
- COMM 431 - Information Technology and the Political Process Credits: 3
- COMM 433 - Environmental Communication Credits: 3
- COMM 454 - Free Speech and Ethics Credits: 3
- COMM 465 - Topics in Communication and Gender Credits: 3

Total: 12 credits

▲ Concentration in Public Relations (PR)

One required course (3 credits):

- COMM 330 - Principles of Public Relations Credits: 3

Three courses (9 credits) chosen from:

- COMM 202 - Media and Society Credits: 3
- COMM 230 - Case Studies in Persuasion Credits: 3
- COMM 260 - Basic Debate Theory and Practice Credits: 3
- COMM 261 - Theories of Argumentation Credits: 3
- COMM 303 - Writing across the Media Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- COMM 335 - Organizational Communication Credits: 3
- COMM 351 - News Writing and Reporting Credits: 3
- COMM 359 - Media Management Credits: 3
- COMM 362 - Argument and Public Policy Credits: 3
- COMM 375 - Mass Communication Advertising and Promotions Credits: 3
- COMM 389 - Public Relations for Associations and Nonprofits Credits: 3
- COMM 390 - Issues in Public Relations Credits: 3
- COMM 391 - Writing for Public Relations Credits: 3
- COMM 411 - Public Relations Practicum Credits: 3
- COMM 430 - Persuasion Credits: 3
- COMM 454 - Free Speech and Ethics Credits: 3

Total: 12 credits
Total: 36 credits

Presentation-Intensive Courses

Students must complete a presentation-intensive course chosen from the following courses. The presentation-intensive course may simultaneously fulfill the requirements for a concentration or for elective courses in communication.

- COMM 100 - Public Speaking Credits: 3
- COMM 210 - Voice and Articulation Credits: 3
- COMM 260 - Basic Debate Theory and Practice Credits: 3
- COMM 310 - Oral Interpretation Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- COMM 356 - Video: Performance and Writing Credits: 3
- COMM 440 - Special Occasion Speaking Credits: 3

Courses Limited to 10 Credits

Of the 120 credits applied to the degree, no more than 10 credits may be in these courses:

- COMM 140 - Forensics Seminar in Creative Arts Credits: 1
- COMM 141 - Forensics Seminar in Recreative Arts Credits: 1
- COMM 142 - Forensics Seminar in Debate: Affirmative Strategies Credits: 1
- COMM 143 - Forensics Seminar in Debate: Negative Strategies Credits: 1
- COMM 145 - Newspaper Workshop I Credits: 1
- COMM 148 - Radio Workshop I Credits: 1
- COMM 157 - Video Workshop Credits: 1
- COMM 340 - Forensics Seminar in Creative Arts Credits: 1
- COMM 341 - Forensics Seminar in Recreative Arts Credits: 1
- COMM 342 - Forensics Seminar in Debate: Affirmative Strategies Credits: 1
- COMM 343 - Forensics Seminar in Debate: Negative Strategies Credits: 1
- COMM 345 - Newspaper Workshop II Credits: 1
- COMM 346 - Yearbook Workshop Credits: 1
- COMM 348 - Radio Workshop II Credits: 1
- COMM 450 - Internship in Communication Credits: 3
- COMM 451 - Facilitating Communication Education Credits: 3
- COMM 452 - Media Production Practicum Credits: 3
- COMM 499 - Independent Study in Communication Credits: 1-3

Writing-Intensive Requirement

The university requires all students to complete at least one course designated as writing intensive in their majors at the 300 level or above. Students majoring in communication fulfill this requirement by successfully completing COMM 300.
Undergraduate Minor

Communication Minor

Banner Code: COM

Web: communication.gmu.edu

The minor in communication is offered by the Department of Communication.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing the minor must complete 18 credits in communication. Students must earn a minimum grade of 2.00 in all courses applied to the minor.

One required course (3 credits)

- COMM 200 - Communication Theory Credits: 3

Two courses (6 credits) chosen from:

- COMM 300 - Foundations of Public Communication Credits: 3
- COMM 301 - Foundations of Interpersonal Communication Credits: 3
- COMM 302 - Foundations of Mass Communication Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3

One course (3 credits) that is public presentation intensive (PPI) chosen from:

Other courses that are PPI may be applied to this requirement with prior written approval of the director of the minor.

- COMM 100 - Public Speaking Credits: 3
- COMM 210 - Voice and Articulation Credits: 3
- COMM 310 - Oral Interpretation Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- COMM 356 - Video: Performance and Writing Credits: 3
- COMM 440 - Special Occasion Speaking Credits: 3

Two elective courses (6 credits) in communication

Students choose any COMM course in consultation with an advisor.
Total: 18 credits

Electronic Journalism Minor

Banner Code: EJ

Web: communication.gmu.edu

Electronic journalism provides a cross-platform foundation with a focus on reporting, research techniques and writing style unique to online, print, broadcast, social media and database journalism.

This minor is not available to communication majors pursuing a concentration in journalism.

This program of study is offered by the Department of Communication.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits with a minimum GPA of 2.00.

Four required courses (12 credits)

- COMM 303 - Writing across the Media Credits: 3
- COMM 351 - News Writing and Reporting Credits: 3
  or
- COMM 352 - News Editing: Print and Beyond Credits: 3
- COMM 361 - Online Journalism Credits: 3
- COMM 475 - Journalism Law Credits: 3

Two elective courses (6 credits) chosen from:

COMM 399 - Special Topics in Communication Credits: 1-3 or COMM 450 - Internship in Communication Credits: 3, when relevant, may be applied to this requirement with prior written approval of the director of the minor.

- COMM 203 - Introduction to Journalism Credits: 3
- COMM 330 - Principles of Public Relations Credits: 3
- COMM 351 - News Writing and Reporting Credits: 3 (if not taken as a required course)
- COMM 352 - News Editing: Print and Beyond Credits: 3 (if not taken as a required course)
- COMM 353 - Broadcast Journalism Credits: 3
- COMM 370 - Feature Writing Credits: 3
- COMM 371 - Sports Writing and Reporting Credits: 3
Sport Communication Minor

Banner Code: SCOM

Web: communication.gmu.edu

The minor in sport communication offers students the opportunity to examine important and timely sports-related issues in an ethical context as well as analyze sports from cross-cultural perspectives. Students will gain an understanding of sport mass media, sport communication, sports reporting, interpersonal and organizational communication, and the impact each has in our global society. The courses cover theory and practice in cross-platform communication, sports ethics and theoretical underpinnings, public relations, and marketing. The minor provides applied fundamentals for students seeking employment in the commercial world of sports (areas such as management or promotion of athletic organizations) and in sports media.

This minor is offered jointly by the Department of Communication and the School of Recreation, Health, and Tourism in the College of Education and Human Development.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits with a minimum GPA of 2.00.

Four required courses (12 credits)

- COMM 303 - Writing across the Media Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- SPMT 201 - Introduction to Sport Management or SPMT 304 - Sport, Culture, and Society Credits: 3
- SPMT 430 - Sport Communication Credits: 3

Two elective courses (6 credits), chosen from:

Special topics courses, when relevant, may be used to fulfill this requirement with the prior written approval of the director. Depending on which courses students took as a required course (above), they may use either SPMT 201 or 304 as an elective.
COMM 305 - Foundations of Intercultural Communication Credits: 3
COMM 330 - Principles of Public Relations Credits: 3
COMM 351 - News Writing and Reporting Credits: 3
COMM 356 - Video: Performance and Writing Credits: 3
COMM 359 - Media Management Credits: 3
COMM 361 - Online Journalism Credits: 3
COMM 371 - Sports Writing and Reporting Credits: 3
COMM 372 - Sports and the Media Credits: 3
SPMT 201 - Introduction to Sport Management Credits: 3
SPMT 302 - Sport and Ethics Credits: 3
SPMT 304 - Sport, Culture, and Society Credits: 3
SPMT 318 - Gender and Racial Issues in Sport Credits: 3
SPMT 405 - Sport Operation and Planning Credits: 3
SPMT 412 - Sport Marketing and Finance Credits: 3
SPMT 420 - Economics and Finance in the Sport Industry Credits: 3
SPMT 440 - Global Perspectives in Sport Credits: 3
SPMT 455 - Governance and Policy in Sport Organizations Credits: 3

Total: 18 credits

Master's Degree

Communication, MA

Banner Code: LA-MA-COM
Web: communication.gmu.edu

The master of arts in communication examines the powerful role played by communication practices in contemporary society. Students may choose to specialize in strategic communication/public relations or health communication or pursue a concentration in science communication. They may also choose an individualized specialization in communication studies according to their interests.

This program of study is offered by the Department of Communication.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in communication, see Application Requirements and Deadlines on the departmental web site.

Admission to the graduate program in communication is competitive.
Degree Requirements

All students follow the same general program structure. All students must take the three program core courses, two theory courses, one practicum course, and five specialization courses, which may include a thesis. Students must select a specialization (Strategic Communication/Public Relations, Health Communication, or Individualized Communication Studies) or concentration (Science Communication); specific requirements are described below. Because it is a narrow specialized area, science communication is subject to the stricter requirements of a concentration.

General Program Requirements (18-21 credits)

Three core courses (9 credits)

- COMM 600 - Introduction to Graduate Studies Credits: 3
- COMM 650 - Research Methodologies in Communication Credits: 3
- COMM 798 - Communication Studies Project Credits: 3

Two theory courses (6 credits) chosen from:

- COMM 602 - Theories and Research of Mass Communication Credits: 3
- COMM 605 - Intercultural Communication Credits: 3
- COMM 620 - Health Communication Credits: 3
- COMM 630 - Theories of Public Relations Credits: 3
- COMM 634 - Theories of Interpersonal Communication Credits: 3
- COMM 635 - Organizational Communication Credits: 3
- COMM 639 - Science Communication Credits: 3 (required for Science Communication concentration)
- COMM 642 - Science and the Public Credits: 3 (required for Science Communication concentration)
- COMM 706 - Strategic Communication Credits: 3

One practicum course (3 credits) chosen from:

Other courses including special topics (590 or 690) and independent study, can be used to fulfill this requirement with prior written approval of the director of graduate studies.

- COMM 604 - Communication Research Practicum Credits: 3
- COMM 636 - Communication Consulting Credits: 3
- COMM 653 - Graduate Communication: Research and Teaching Credits: 3
- COMM 655 - Theories of Visual Communication in Telecommunications Credits: 3
- COMM 660 - Climate Change and Sustainability Communication Campaigns Credits: 3
- COMM 670 - Social Marketing Credits: 3
- COMM 694 - Communication Internship Credits: 3
- COMM 697 - Independent Production Credits: 1-3
- COMM 721 - E-Health Communication Credits: 3
- COMM 820 - Health Communication Campaigns Credits: 3
Optional Thesis (3 credits)

Students who choose to write a thesis should be aware of the policies governing theses as stated in the Academic Policies chapter of this catalog. If a thesis is chosen, students must follow the thesis enrollment policy of the university and once enrolled in COMM 799, maintain continuous enrollment.

Students who do not choose to complete a thesis will take additional credits of concentration or specialization courses.

Specializations or Concentration (12 or 15 credits)

Students complete the degree by completing additional coursework in one of the specializations or in the concentration.

Strategic Communication/Public Relations specialization

Students must complete an additional 12-15 credits toward the degree. The specialization in strategic communication/public relations requires a minimum of two courses from the list below. A course taken as a part of the general program cannot be duplicated, but it can count as a course required for the specialization. Additional credit may be met by any graduate COMM coursework.

- COMM 590 - Seminar in Communication Credits: 3 (when topic is strategic communication, as approved by program director)
- COMM 602 - Theories and Research of Mass Communication Credits: 3
- COMM 615 - Political Communication Credits: 3
- COMM 630 - Theories of Public Relations Credits: 3
- COMM 636 - Communication Consulting Credits: 3
- COMM 637 - Risk Communication Credits: 3
- COMM 660 - Climate Change and Sustainability Communication Campaigns Credits: 3
- COMM 670 - Social Marketing Credits: 3
- COMM 690 - Special Topics in Communication Credits: 3 (when topic is strategic communication, as approved by program director)
- COMM 706 - Strategic Communication Credits: 3
- COMM 735 - Crisis Communication Credits: 3
- COMM 806 - International Public Relations Credits: 3
- COMM 820 - Health Communication Campaigns Credits: 3
- COMM 890 - Special Topics in Communication Credits: 3 (when topic is strategic communication, as approved by program director)

Health Communication Specialization

Students must complete an additional 12-15 credits toward the degree. The specialization in health communication requires a minimum of two courses from the list below. A course taken as a part of the general program cannot be duplicated, but it can count as a course required for the specialization. Additional credit may be met by any graduate COMM coursework.

- COMM 590 - Seminar in Communication Credits: 3 (when topic is health communication as approved by program director)
- COMM 620 - Health Communication Credits: 3
- COMM 690 - Special Topics in Communication Credits: 3 (when topic is health communication as approved by program director)
• COMM 705 - Intercultural Health and Risk Communication Credits: 3
• COMM 720 - Consumer-Provider Health Communication Credits: 3
• COMM 721 - E-Health Communication Credits: 3
• COMM 820 - Health Communication Campaigns Credits: 3
• COMM 890 - Special Topics in Communication Credits: 3 (when topic is health communication as approved by program director)

**Individualized Communication Studies specialization**

Students design a program of courses to reflect their interests in consultation with their advisor. Students may select special topics courses (590, 690, or 890) as approved by program director.

• COMM 590 - Seminar in Communication Credits: 3
• COMM 690 - Special Topics in Communication Credits: 3
• COMM 890 - Special Topics in Communication Credits: 3

▲ **Science Communication Concentration (SCMN)**

• COMM 639 and COMM 642 are required theory courses for the concentration.
• COMM 641 - Communication Competencies for Scientists Credits: 3 is the required practicum course for students in the concentration.

**Required (3 credits)**

• COMM 640 - Controversies in Science Communication Credits: 3
  or
• COMM 644 - Analysis and Criticism of Science Journalism Credits: 3

**Electives (9-12 credits)**

• At least one science-related course (3 credits) outside the department. Course(s) must be chosen from graduate courses in science, social science or science policy for which students are qualified and which have been approved by the program director.
• The remaining courses in the concentration must be other graduate-level COMM courses, to include the optional thesis.

**Total: 12-15 credits**

**Total: 33 credits**
Master's Level Certificate

Science Communication Graduate Certificate

Banner Code: LA-CERG-SCMN

Web: communication.gmu.edu

This certificate is designed for graduate students with or without an academic communication background to upgrade their knowledge of the field. It is geared to meet the needs of both communication professionals and science professionals who want to emphasize science communication work in their future careers.

This program of study is offered by the Department of Communication.

The graduate certificate in science communication may be pursued on a part-time or full-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in science communication, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

All course choices included in this certificate must be approved by the department.

One required course (3 credits)

- COMM 639 - Science Communication Credits: 3

One course (3 credits) in communication research methods chosen from:

- COMM 650 - Research Methodologies in Communication Credits: 3
- COMM 675 - Content Analysis Credits: 3
- COMM 725 - Qualitative Methods Credits: 3

Two courses in COMM (6 credits) chosen from:

These courses include communication content directly relevant to science or to communication work in science-oriented organizations.

- COMM 637 - Risk Communication Credits: 3
COMM 640 - Controversies in Science Communication Credits: 3
COMM 641 - Communication Competencies for Scientists Credits: 3
COMM 642 - Science and the Public Credits: 3
COMM 644 - Analysis and Criticism of Science Journalism Credits: 3
COMM 660 - Climate Change and Sustainability Communication Campaigns Credits: 3
COMM 735 - Crisis Communication Credits: 3

One elective course in COMM (3 credits)

Total: 15 credits

Doctoral Degree

Communication, PhD

Banner Code: LA-PHD-COM

Web: communication.gmu.edu

The doctor of philosophy degree in communication at Mason examines the powerful roles performed by communication in contemporary society. The program has two major areas of emphasis: health and strategic communication. Students may also emphasize science communication in conjunction with either of these.

This program of study is offered by the Department of Communication.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. Applicants to the PhD in communication must already have earned a master's degree in a relevant field.

For information specific to the PhD in communication, see Application Requirements and Deadlines on the departmental web site.

Reduction of Credit

Students must have a master's degree before being admitted to the PhD in communication. Most students receive a reduction of study of 30 credits based on their previous master's degree.

Degree Requirements
To receive the PhD in communication, students must complete a minimum of 90 credits, 60 beyond the master’s degree, including core courses in theory and research methods, course work in substantive fields of study, and a research practicum. Following completion of all required course work, students must pass a written qualifying examination and an oral defense of it, after which they are advanced to candidacy by the dean and complete a dissertation, an original and independent research project.

If specific requirements are waived, students must complete substitutions, which are recorded on their Program of Study. All substitutions to degree requirements must be approved by the graduate committee.

Four theory courses (12 credits)

One required theory course (3 credits)

- COMM 600 - Introduction to Graduate Studies Credits: 3

Three additional theory courses (9 credits) chosen from:

- COMM 602 - Theories and Research of Mass Communication Credits: 3
- COMM 605 - Intercultural Communication Credits: 3
- COMM 634 - Theories of Interpersonal Communication Credits: 3
- COMM 635 - Organizational Communication Credits: 3

Three research methods courses (9 credits)

One required methods course

- COMM 650 - Research Methodologies in Communication Credits: 3

One qualitative methods course

Students may take COMM 725 or another course at 700-level or above as approved by the graduate committee.

One additional research methods course at the 700-level or above

This course should be chosen to help prepare for the dissertation and must be approved by the graduate committee.

Six courses (18 credits) in one of the following substantive fields of study:
Health communication

Three courses (9 credits) chosen from:

- COMM 620 - Health Communication Credits: 3
- COMM 705 - Intercultural Health and Risk Communication Credits: 3
- COMM 720 - Consumer-Provider Health Communication Credits: 3
- COMM 820 - Health Communication Campaigns Credits: 3

Three elective courses (9 credits) chosen with approval of the advisor and director

Strategic communication

Three courses (9 credits) chosen from:

- COMM 630 - Theories of Public Relations Credits: 3
- COMM 705 - Intercultural Health and Risk Communication Credits: 3
- COMM 706 - Strategic Communication Credits: 3
- COMM 735 - Crisis Communication Credits: 3

Three elective courses (9 credits) chosen with approval of the advisor and director

One research practicum (3 credits) chosen from:

- COMM 604 - Communication Research Practicum Credits: 3
- COMM 890 - Special Topics in Communication Credits: 3
- COMM 896 - Independent Study Credits: 3

Electives (0-30 credits)

Students complete the remaining 90 credits through additional elective courses chosen in consultation with an advisor.

Dissertation (18 credits)

Once enrolled in 998, students in this degree program must maintain continuous registration for at least 1 credit. Once enrolled in 999, student must maintain continuous registration each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy.
as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students may apply to this degree a minimum of 3 and a maximum of 6 credits of 998 and a minimum of 12 and a maximum of 15 credits of 999. They may apply a maximum of 18 dissertation credits (998 and 999 combined) to the degree. Because of the continuous registration policy, students may be required to register for additional credits of these courses.

- COMM 998 - Doctoral Dissertation Proposal Credits: 1-6
- COMM 999 - Doctoral Dissertation Research Credits: 1-15

Total: 90 credits

Advancement to Candidacy

To advance to candidacy, students must complete all course work required on their approved program of study. Students must also successfully pass a written qualifying exam and an oral qualifying exam. In addition, students must have a dissertation committee appointed by the Dean’s Office as well as an approved proposal. Evidence of the approved proposal must be on file in the Dean’s Office before a student can advance to candidacy.

■ Cultural Studies

Phone: 703-993-2851
Web: culturalstudies.gmu.edu

Faculty

Albanese, Amireh, Best, Bickford, Bockman, Burr, Censer, M. Chang, Y. Chang, Copelman, Crew, Dale, Deshmukh, Dodman, Foster, Froman, Fuchs, Gibson, Gilbert, Greet, Groening, Guagnano, Gusterson, Haines, Hanrahan, Harvey, Hodges, Holt, Jacobs, Jann, Johnsen-Neshati, Kaplan, Kaposy, Karush, Kaufmann, Kim, Lancaster (director), Landsberg, Leeman, Lont, Mandaville, Matz, Mcfarlane, Mantz, Miller, O’Connor, O’Malley, Palkovich, Rabin, Ricouart, Rosenblum, Samara, Sample, Scarlata, Seligman, Shutika, P. Smith, S. Smith, Sockett, Todd, Travis, Yadav, Yocom, Zagarri

Course Work

The Cultural Studies Program offers all course work designated CULT in the Courses chapter of this catalog.

Cultural Studies at Mason

The Cultural Studies Program is distinctive in several respects. While similar programs at other universities are based in a department, the program at Mason has a truly interdisciplinary foundation, drawing on faculty members from 14 different departments across the university. The program explicitly links the social sciences and the humanities by combining their methods of interpretation to explore the production, distribution, and consumption of cultural objects in their social contexts. With particular focus on theory and method in crafting this linkage, the program addresses contemporary issues of nationality, class, race, and gender and opens the scope of scholarly inquiry to all forms of culture, past and present.
Undergraduate Programs

Cultural studies does not have an undergraduate program, but supports the interdisciplinary undergraduate program in global affairs as well as a special topics course in cultural studies. CULT 320 - Globalization and Culture is a core requirement for students majoring in global affairs. CULT 390 - Topics in Cultural Studies is a course whose content will change from offering to offering and will be of special interest in global affairs.

Graduate Programs

The doctoral program in cultural studies trains students for scholarship and teaching. The core curriculum includes an introduction to cultural studies and a methods course, as well as courses on political economy, gender and sexuality, critical race studies, science and technology, social institutions, and visual and performance culture.

All students develop field specializations in two areas of cultural studies. The particular strengths of the program are visual culture, media, and new media studies; political economy and globalization; gender and sexuality studies.

Funding

The program offers teaching assistantships and fellowships, which are awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students awarded assistantships must register for a minimum of six credits a semester and show satisfactory progress toward their degree.

Related Master's Degrees

Applicants to the doctoral degree in cultural studies must already hold a master's degree. Students interested in pursuing the PhD in cultural studies at Mason who do not meet this requirement might wish to consider one of the related master's degrees at Mason (anthropology, English, history, foreign languages, philosophy, and sociology.) Of course, the required master's degree may be taken from any institution of your choice.

Doctoral Degree

Cultural Studies, PhD

Banner Code: LA-PHD-CULT

Web: culturalstudies.gmu.edu

The doctoral program in cultural studies is offered by the Cultural Studies Program.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. Applicants to the PhD in cultural studies must already have earned a master’s degree in a relevant field.
For further information specific to the PhD in cultural studies, see Application Requirements and Deadlines on the college web site.

Reduction of Credit

Students must have a master's degree before being admitted to the PhD in cultural studies. Most students receive a reduction of study of 30 credits based on their previous master's degree.

Advancement to Candidacy

To advance to candidacy, students must successfully complete all course work required on their approved program of study and demonstrate proficiency in a foreign language. Students must also successfully complete two written field statements and pass an oral comprehensive exam based on them.

Degree Requirements

As with all doctoral programs, the emphasis in this program is on the development of intellectual mastery and professional competence. Students must complete a minimum of 78 credits, 48 beyond the master's degree. The most important requirements are the field statements and defense and completion of a doctoral thesis that reflects the student’s ability to do original interdisciplinary work that meets professional standards.

Four core courses (12 credits)

- CULT 802 - Histories of Cultural Studies Credits: 3
- CULT 804 - Histories of Cultural Studies II Credits: 3
- CULT 806 - Research Seminar in Cultural Studies Credits: 3
- CULT 808 - Student/Faculty Colloquium in Cultural Studies Credits: 1 (Students must take CULT 808 a minimum of 3 times.)

One course (3 credits) in theory chosen from:

- CULT 810 - Culture and Political Economy Credits: 3
- CULT 814 - Gender and Sexuality Credits: 3
- CULT 820 - After Colonialism Credits: 3

One course (3 credits) in a topic chosen from:

- CULT 812 - Visual Culture Credits: 3
- CULT 816 - Science/Technology Credits: 3
- CULT 818 - Social Institutions Credits: 3

Field Requirements (18 credits)
Under the guidance of faculty advisory committees, students define two fields that point topically and theoretically toward teaching interests, dissertation research, and related forms of professional development. Students select relevant courses from theory or topic courses not used to fulfill the previous requirements or from special topics courses. If doctoral level coursework is not available in a given area, students may take one independent study (CULT 870) to support the development of the field.

Students must take a minimum of three courses (9 credits) in two different fields. The 9 credits in each field must include a relevant section of CULT 880 taught by that field’s primary advisor.

- CULT 880 - Field Concentration Credits: 3

Field Statements

Students demonstrate competence in each of their two chosen fields by producing and orally defending a field statement that consists of a comprehensive, critical literature review. The field statements and the defense constitute the candidacy exam for the PhD in cultural studies.

Up to one course in methodology (0-3 credits)

Students must take one course in a relevant methodology in which they are not already trained. Students choose the specific course from program or departmental graduate offerings (600 level or above) under the guidance of their faculty advisory committee.

A course chosen to fulfill the credits for a field requirement, if relevant, may be used to meet the methodology requirement with permission of the faculty advisory committee. Students who do not take a relevant and approved methodology course in partial fulfillment of a field requirement need to take an methodology course (3 credits) to fulfill this requirement. They will have a degree total of 51 credits.

Proficiency in a foreign language

Students are required to demonstrate proficiency in at least one foreign language before being permitted to defend the doctoral dissertation proposal.

Electives (0-30)

Students can complete the 78 credit requirement through credits of additional coursework chosen in consultation with an advisor.

Dissertation (12 credits)

Once enrolled in 998, students in this degree program must maintain continuous registration in 998 or 999 each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students must complete a minimum of 3 credits of 999. They may apply a maximum of 12 dissertation credits (998 and 999 combined) to the degree.

- CULT 998 - Doctoral Dissertation Proposal Credits: 1-6
- CULT 999 - Doctoral Dissertation Credits: 1-12 (minimum of 3 credits)
Total: 78-81 credits

■ Economics

Phone: 703-993-1151
Web: economics.gmu.edu

Faculty

Distinguished professors emeriti: Buchanan, Smith, Tullock

Professors emeriti: Chung, Phillips, Vaughn

Professors: Bennett, Boettke, Boudreaux, Caplan, Congleton, Cowen, Heiner, Houser (chair), Klein, Levy, McCabe, Nye, Roberts, Rowley, Stratmann, Wagner, White, Williams

Associate professors: Castillo, Hanson, Jones, Leeson, Meyer, Petrie, Ramirez, Tabarrok, Wiest

Assistant professors: Al-Ubaydli, Coyne, Johnson

Term assistant professor: Rustici

Course Work

The Economics Department offers all course work designated ECON in the Courses chapter of the catalog.

Undergraduate Programs

The department offers a bachelor of arts and a bachelor of science degree in economics. The bachelor of science degree program is designed for students who desire a more technical program with a stronger emphasis on economic and quantitative analysis. It is especially appropriate for students who anticipate a career as an economic analyst in government, consulting, trade associations, or private sector positions that emphasize economic research and analysis. The requirements are also suitable for students planning postgraduate education in economics or more quantitative business administration programs.

Students interested in careers in the business world can pursue a concentration in managerial economics within the BS in economics.

The bachelor of arts degree in economics is designed for students with an interest in the liberal arts. It is appropriate for those who prefer a less quantitative degree program and may be especially suitable for students planning to attend law school or graduate programs in business or public administration.

Minors

The department offers a minor in economics and a minor in economic systems design. Both are available to students in any major.
Bachelor’s/Accelerated Master’s Program

The department offers highly qualified undergraduates the opportunity to apply to an accelerated master’s degree program in economics. If accepted, students will be able to earn both an undergraduate and a graduate degree after satisfactory completion of 144 credits, sometimes within five years.

Graduate Programs

The department offers a master’s and a doctoral degree in economics. The department is noted for its emphasis on comparative institutional analysis and its focus on the relations among economic, political, and legal institutions. This is reflected in the specializations associated with the department: experimental economics, Austrian economics, public choice, constitutional political economy, law and economics, and new institutional economics.

The department offers a graduate certificate in economic systems design, which provides a well defined course of study for students who want to advance or update their knowledge in this fast-moving field.

Funding

The department offers graduate teaching and research assistantships and fellowships that are awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students with assistantships must register for a minimum of six credits a semester and, like all students, demonstrate satisfactory progress toward their degree.

Undergraduate Degree

Economics, BA

Banner Code: LA-BA-ECON

Web: economics.gmu.edu

The BA in economics is designed for students with a strong interest in the liberal arts. It is appropriate for those who prefer a less quantitative degree program than the BS in economics and may be especially appropriate for students planning to attend law school or graduate programs in business or public administration.

Some economics courses may fulfill the university-wide general education requirement in global understanding or the college requirement in non-Western culture. Check with the departmental advising office for more information. Economics majors can fulfill the university-wide general education synthesis requirement with ECON 309.

This program of study is offered by the Department of Economics.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in economics must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete the course work below with a minimum GPA of 2.00 overall in their ECON coursework. Students must also complete ECON 103 and 104 with at least a 2.00 (C) in each.
Six or seven required courses 18-19 credits)

- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3
- ECON 306 - Intermediate Microeconomics Credits: 3
- ECON 311 - Intermediate Macroeconomics Credits: 3
- MATH 108 - Introductory Calculus with Business Applications Credits: 3 or HNRT 125 - A Liberal Arts Approach to Calculus Credits: 3 or MATH 113 - Analytic Geometry and Calculus I Credits: 3
- IT 103 - Introduction to Computing Credits: 3 or CS 112 - Introduction to Computer Programming Credits: 4 or both
- MIS 102 - Spreadsheet Applications for Business Credits: 1 and HNRS 353 - Technology in the Contemporary World (3 credits)

One or two courses in statistics (4 or 6 credits)

- OM 210 - Statistical Analysis for Management Credits: 4 or both STAT 250 - Introductory Statistics I Credits: 3 and STAT 350 - Introductory Statistics II Credits: 3 or both STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3 and STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3

Eight elective courses (24 credits)

Students choose their electives from courses in economics at the 300 and 400 level. ECON 385 may not be used to fulfill this requirement.

Total: 46 or 49 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in economics fulfill this requirement by successfully completing ECON 345, 355, 365, 435, or 470.

Economics, BS

Banner Code: LA-BS-ECON

Web: economics.gmu.edu

The BS in economics is designed for students who desire a more technical program than the BA, one with a stronger emphasis on economic and quantitative analysis. It is especially appropriate for students who anticipate a career as an economic analyst in government, consulting, trade associations, or other private sector positions that emphasize economic research and analysis. The requirements are also appropriate for students planning postgraduate education in economics or more quantitative business administration programs.
Some economics courses may fulfill the university-wide general education requirement in global understanding. Check with the departmental advising office for more information. Economics majors can fulfill the university-wide general education synthesis requirement with ECON 309.

This program of study is offered by the Department of Economics.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BS in economics must complete additional college requirements for the BS degree in the College of Humanities and Social Sciences.

Students pursuing the BS in economics must complete the course work below, earning a minimum GPA of 2.00 overall in their ECON coursework. Students must complete ECON 103 and 104 with at least a 2.00 (C) in each.

BS without a Concentration

Eight required courses (26 credits)

- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3
- ECON 306 - Intermediate Microeconomics Credits: 3
- ECON 311 - Intermediate Macroeconomics Credits: 3
- ECON 345 - Introduction to Econometrics Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- IT 103 - Introduction to Computing Credits: 3

Two courses in statistics (6 credits) chosen from one of these sequences:

- STAT 250 - Introductory Statistics I Credits: 3
- STAT 350 - Introductory Statistics II Credits: 3
  or
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3

One course (3 credits) chosen from:
• ACCT 203 - Survey of Accounting Credits: 3
• STAT 362 - Introduction to Computer Statistical Packages Credits: 3

Eight elective courses (24 credits)

Electives are chosen from courses in economics at the 300 and 400 level. ECON 385 may not be used to fulfill this requirement. If ECON 340 - Introduction to Mathematical Economics (3 credits) is chosen as an elective, students need not take the 4-credit course MATH 114; however, MATH 114 is strongly recommended for students considering graduate school in economics since it is required for admission to most graduate programs. An additional calculus course beyond MATH 114 is also advisable for students considering graduate study in economics.

Total: 59 credits

▲ Concentration in Managerial Economics (MECN)

Student who wish to focus their BS in economics for application in the business world may choose to pursue a concentration in managerial economics. They complete 62 credits, 10 of which may be used also to fulfill general education requirements.

Seven required courses in economics (21 credits):

ECON 103 fulfills the general education requirement in social and behavioral science.

• ECON 103 - Contemporary Microeconomic Principles Credits: 3
• ECON 104 - Contemporary Macroeconomic Principles Credits: 3
• ECON 306 - Intermediate Microeconomics Credits: 3
• ECON 308 - Managerial Economics and Strategy Credits: 3
• ECON 310 - Money and Banking Credits: 3
• ECON 311 - Intermediate Macroeconomics Credits: 3
• ECON 345 - Introduction to Econometrics Credits: 3

Two courses in statistics (6 credits):

Students choose one of these sequences.

• STAT 250 - Introductory Statistics I Credits: 3
• STAT 350 - Introductory Statistics II Credits: 3

or

• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
• STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3

Four required courses in math, accounting, and information technology (14 credits):

IT 103 fulfills the general education requirement in information technology. MATH 113 fulfills the general education requirement in quantitative reasoning.
• ACCT 203 - Survey of Accounting Credits: 3
• IT 103 - Introduction to Computing Credits: 3
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
ECON 340 may NOT be substituted for MATH 114 for the concentration.

One required course in business writing (3 credits):

• SOM 301 - Business Models: A Communication Approach Credits: 3

Three elective courses in economics (9 credits) chosen from:

ECON 496 requires departmental permission.

• ECON 321 - Economics of Labor Credits: 3
• ECON 370 - Economics of Industrial Organization Credits: 3
• ECON 390 - International Economics Credits: 3
• ECON 412 - Game Theory and Economics of Institutions Credits: 3
• ECON 415 - Law and Economics Credits: 3
• ECON 420 - International Money and Finance Credits: 3
• ECON 496 - Special Topics in Economics Credits: 3

Two elective courses (6 credits) in economics chosen from courses at the 300 and 400 level.

ECON 385 may not be used to fulfill this requirement.

One elective course (3 credits) not in economics chosen from:

• BULE 302 - Legal Environment of Business Credits: 3
• FNAN 301 - Financial Management Credits: 3
• MGMT 301 - People and Organizations Credits: 3
• MKTG 301 - Principles of Marketing Credits: 3
• MIS 301 - Introduction to Business Information Systems Credits: 3
• OM 301 - Operations Management Credits: 3

Total: 62 credits
Writing-Intensive Requirement

The university requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in economics fulfill this requirement by successfully completing ECON 345, 355, 365, 435, or 470.

Undergraduate Minor

Economic Systems Design Minor

Banner Code: ESD

Web: economics.gmu.edu

The design of processes that efficiently allocate resources and foster exchange are crucial in society, organizations, personal interactions, and individual decision making. Economic systems design is the scientific study of the design, development, testing, and understanding of economic institutions. Economic systems design explores problems in the design of allocation systems and provides a method to develop and test the properties of such systems. A minor in economic systems design prepares students to undertake the scientific process of understanding and developing systems of exchange and their incentives. The skills offered through this minor can be of use to e-commerce designers, policy analysts, systems designers, engineers, and computer scientists.

This program of study is offered by the Department of Economics.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 15 credits of coursework with a minimum GPA of 2.00.

Three required courses (9 credits)

- ECON 440 - Economic Systems Design: Principles and Experiments Credits: 3
- ECON 441 - Economic Systems Design: Case Studies and Analysis Credits: 3
- ECON 442 - Economic Systems Design: Implementation Credits: 3

Two elective courses (6 credits)

Students can choose from the courses below or others chosen in consultation with the director of the minor.

- MIS 491 - Seminar in Management Information Systems Credits: 3
- MATH 441 - Deterministic Operations Research Credits: 3
- SYST 420 - Network Analysis Credits: 3
- SYST 470 - Human Factors Engineering Credits: 3
- CS 480 - Introduction to Artificial Intelligence Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3
ECON 335 - Environmental Economics Credits: 3
ECON 415 - Law and Economics Credits: 3

Total: 15 credits

Economics Minor

Banner Code: ECON
Web: economics.gmu.edu

Economics is an essential tool for understanding the complexities of modern society. Economics analyzes how people with limited resources make choices and how we might make better choices. A minor in economics is an extremely flexible and marketable choice. Whether students primary interest is in business, communications, policy, data management, international studies, or engineering, a minor in economics gives them an additional edge in the workplace.

This program of study is offered by the Department of Economics.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students must have a minimum GPA of 2.00 overall in coursework applied to the minor. Students must also complete ECON 103 and 104 with a minimum grade of 2.00 (C) in each. A minimum of 9 credits of upper-level economics courses must be taken at Mason.

Three required courses (9 credits)

- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3
- ECON 306 - Intermediate Microeconomics Credits: 3

Four elective courses (12 credits)

Students choose their electives from courses in economics at the 300 or 400 level. ECON 385 may not be used to fulfill this requirement.

With permission of the department chair or undergraduate director, a course in a closely related field may be substituted for 3 credits of economics electives. A course in statistics is highly recommended, and OM 210, or STAT 250 or 344 may be substituted for up to 3 credits of economics electives.

Total: 21 credits
Bachelor's/Accelerated Master's Program

Economics, BA or BS/Economics, Accelerated MA

Web: economics.gmu.edu

Highly qualified Mason economics majors may apply to the accelerated master’s degree program. If accepted, students will be able to earn both bachelor’s and master’s degrees in economics after satisfactory completion of 144 credits. Graduates are exceptionally well-prepared for professional school or a PhD program in economics or a related discipline.

This program of study is offered by the Department of Economics.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in economics, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

Master's Degree
Economics, MA

Banner Code: LA-MA-ECON

Web: economics.gmu.edu

The master's degree in economics strengthens students' knowledge of economic theory and improves their skills in applying the theory to economic problems. Graduates are qualified to read and judge other research and conduct their own research, either individually or as members of government or business teams. They are also prepared to write policy analysis articles. Students who plan to pursue a PhD in economics should apply directly to the doctoral program.

This program of study is offered by the Department of Economics.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in economics, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

Five core courses (15 credits)

In place of core courses ECON 535, 611, 612, and 615, students admitted to the PhD in economics can substitute ECON 637, 811, 812, and 715.

- ECON 535 - Survey of Applied Econometrics Credits: 3
- ECON 611 - Microeconomic Theory Credits: 3
- ECON 612 - Microeconomic Theory II Credits: 3
- ECON 615 - Macroeconomic Theory Credits: 3
- ECON 630 - Mathematical Economics I Credits: 3

Five elective courses (15 credits)

Students choose their electives from economics courses in any of the fields offered by the department. Students may substitute up to 6 credits of courses outside economics in closely related fields with prior written approval of the MA director.

Students have the option of writing a thesis for 6 credits in lieu of 6 credits of elective courses.

Comprehensive Exam

Students must pass one comprehensive exam in applied economic theory. This exam is offered twice each year. Students admitted to the PhD in economics must pass one qualifying exam, which will count as the comprehensive exam for the MA.
6 credits of thesis (optional)

Once enrolled in ECON 799, students are required to maintain continuous registration until the thesis is submitted to and accepted by the University Library. The continuous registration policy is specified in the Academic Policies chapter of the catalog.

- ECON 799 - Master's Thesis Credits: 1-6

Total: 30 credits

Master's Level Certificate

Economic Systems Design Graduate Certificate

Banner Code: LA-CERG-ECSD

Web: economics.gmu.edu

The certificate in economic systems design provides graduate students with a program of courses and laboratory experience. Course work for the graduate certificate can be used for credit toward the MA and PhD in economics. The primary purpose is to provide a well defined target for students who want to advance or update their knowledge in this fast-moving field.

Graduate students in economics, computer science, mathematics, systems engineering, and informatics find this certificate a strong complement to their major area of study. The courses and project work provide skills that can be used in electronic commerce, public policy, and internal firm resource allocation processes.

This program of study is offered by the Department of Economics.

For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in economic systems design may be pursued on a part-time or full-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in economic systems design, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Students must have a minimum cumulative GPA of 3.00 in courses applied to the certificate with no more than one course with a grade of C (2.00).

Three courses (9 credits) in economic systems design
Two elective courses (6 credits)

Students choose the elective courses in consultation with an advisor in economics.

Total: 15 credits

Doctoral Degree

Economics, PhD

Banner Code: LA-PHD-ECON

Web: economics.gmu.edu

The PhD in economics prepares students for careers in academia, business, and government. Core courses train students in modern theory and quantitative techniques, while field courses stress the application of theory to relevant economic problems. Dissertation work requires students to master and apply the skills of original research. The department emphasizes publishing; many students have had articles accepted for publication in professional journals while in the graduate program. Research in the Department of Economics covers a broad spectrum, from problems of immediate policy importance to fundamental questions of economic and social organization.

This program of study is offered by the Department of Economics.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the PhD in economics, see Application Requirements and Deadlines on the departmental web site.

Reduction of Credit

Students who enter with a master's degree may have their credit requirement reduced by up to 30 credits, depending on the department's judgment about the degree of closeness of that work to work that would have been taken at George Mason University. Reduction also requires approval of the dean. Requests for reduction of credit are reviewed only after acceptance to the doctoral program.
Program of Study

All students must have an approved program of study as specified in the section Requirements for Doctoral Degrees in the Academic Policies chapter of the catalog.

Advancement to Candidacy

To advance to candidacy, students must complete all course work required on their approved program of study and all exams. In addition, students must have a dissertation committee appointed by the dean as well as an approved proposal. Evidence of the approved proposal must be on file in the Dean’s Office before a student can advance to candidacy.

Degree Requirements

The program requires 72 credits of coursework and dissertation. Students must earn a minimum GPA of 3.00 in coursework applied to the degree. No more than two courses with a grade of 2.00 may be applied toward the degree.

Six core courses (18 credits)

- ECON 630 - Mathematical Economics I Credits: 3
- ECON 637 - Econometrics I Credits: 3
- ECON 715 - Macroeconomic Theory I Credits: 3
- ECON 811 - Microeconomic Theory I Credits: 3
- ECON 812 - Microeconomic Theory II Credits: 3
- ECON 816 - Macroeconomic Theory II Credits: 3

Elective courses (30-42 credits)

Students choose their electives from economics courses in any of the fields offered by the department. Students may substitute up to 6 credits of courses outside economics in closely related fields with prior written approval of the director of the graduate program.

Comprehensive exams

Students must successfully pass comprehensive exams in microeconomics and macroeconomics.

Field exams

Students must successfully pass field exams in two knowledge areas. Subject to course availability, the department offers courses in the following fields of study on which the knowledge area field exams will be based. Because the specific courses offered each year vary, students should consult the department for the courses that can be used for each field.

- Austrian economics
- Constitutional economics
- Economic history
• Experimental economics
• Industrial organization
• Individualized field exam
• Institutions and development
• Law and economics
• Monetary theory
• Public choice
• Public finance

Dissertation (12 to 24 credits)

Once enrolled in 998, students in the economics doctoral program must maintain continuous registration in 998 or 999 each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students must complete a minimum of 3 credits of 999. They may apply a minimum of 12 and a maximum of 24 dissertation credits (998 and 999 combined) to the degree.

• ECON 998 - Doctoral Dissertation Proposal Research. Credits: 1-9
• ECON 999 - Doctoral Dissertation Research Credits: 1-15 (minimum of 3 credits)

Total: 72 credits

■ English

Phone: 703-993-1160
Web: english.gmu.edu

Faculty

Professors: Albanese, Cheuse, D’Andrea (Robinson Professor), Foster, Goodwin, Hodges, Jann, Kaufmann, Lathbury, Lowry, Matz (chair), Mori, Nadeau, Pankey, Tichy

Associate professors: Amireh, Anderson, Atkinson, Brkic, Burr, Chang, Clark, Eisner, Fuchs, Gallehr, Harvey, Holisky, Jones, Kaplan, Keith, Kearney, Kubrick, Lattanzi Shutika, Malouf, Reid, Rutledge, Weinberger, Yadav, Yocom, Zawacki

Assistant professors: Eyman, Fraser, Groening, Habila, Hoffmann, Lin, Lockwood, Marcanonio, McCarthy, Michals, Rogers, Sample, Scarlata, Stanica, Wheelock, Wiederhold, Wulf

Term associate professors: Koch, Miller, Samuelian, Scott, Taciuch, Thompson

Term assistant professors: Berg, Burnham, DeFazio, Johnson, King, Lawrence, Lister, Matthews, McGeehan, Nanian, Nichols, Photos, Rudnicki, Saunders, Taylor, Williams

Term instructors: Hoy, Raffel, Scolaro
Adjunct assistant professors: Broyles, Cabral, Casal, Dutta, Fowler, Grogan-Barone, Humbertson, Jacobs, Johnston, Kuhta, Mallett, Moody, Pabich

Adjunct instructors: Cooper, Holcomb

Course Work

The English Department offers all course work designated CL, ENGH, LING, and NAIS in the Courses chapter of this catalog. The subject code ENGH replaces ENGL in the 2011-2012 Catalog.

Related Courses

Courses offered by other departments are occasionally cross listed with English and given the ENGH subject code. Such courses may be applied to the English major.

Undergraduate Programs

The department offers a bachelor's degree in English. This is a versatile major with thirteen concentrations designed to meet students' individual interests and career objectives. English majors can also pursue a special option in comparative literature and do an internship in technical writing or linguistics. Students interested in becoming teachers can participate in a program offered in conjunction with the College of Education and Human Development that allows undergraduates to simultaneously complete their BA in English and their licensure requirements to teach English at the secondary school level in Virginia.

English majors learn to read critically and write carefully in classes that are uniquely small for a university the size of Mason. Students develop these abilities not only thorough reading traditional texts but also through the use of technologies such as blogs, wikis, and multimedia production. Because English majors have excellent skills in written and oral communication, research, critical thinking, and focused creativity they are well prepared for any career - teaching, journalism, creative writing, management, law, and more.

300-level courses teach the foundational principles for a field of study, include courses of broad scope, and provide an introduction to a genre, literary period, or methodology.

400-level courses provide an in-depth approach to a field of study, a single genre, literary period, or methodology. They include special topics classes and English honors classes. Some 400-level courses require ENGH 325 as a prerequisite.

Honors in the Major

Highly qualified students may pursue advanced work leading to graduation with honors in the major. To graduate with honors in the major, students must complete a two-course honors sequence and receive a minimum GPA of 3.50 in all courses counted toward the major and, separately, a minimum GPA of 3.50 in their honors courses. Honors courses may simultaneously satisfy concentration and distribution requirements in the major.

Students satisfy the honors course sequence by taking one of the following:

- Two sections of ENGH 414 - Honors Seminar
- ENGH 414 - Honors Seminar and ENGH 415 - Honors Thesis Writing Seminar
- ENGH 414 - Honors Seminar and writing a creative honors thesis in ENGH 416 - Honors Independent Study (for students in the creative writing concentration)
- ENGH 416 - Honors Independent Study in conjunction with an advanced course in nonfiction writing and completing a nonfiction thesis as part of ENGH 415 - Honors Thesis Writing Seminar (for students in the nonfiction concentration)
Students interested in pursuing honors in the major should consult the English Department for more information and to learn about the application process.

**English with a Second Major**

Students can combine a major in English with a second major. Students interested in this option are encouraged to discuss their plans with their English advisor and the director of undergraduate programs in English. See the section on Credit for More than One Undergraduate Major in the Academic Policies chapter of the catalog.

**Minors**

The department offers a minor in English, which is available to students in any major at Mason.

Faculty from English coordinate or co-coordinate the Film and Media Studies Minor, the Folklore and Mythology Minor, the Native American and Indigenous Studies Minor, and the Linguistics Minor. See the Academic Policies section of this chapter for more information.

**Bachelor’s/Accelerated Master’s Program**

The department offers highly qualified undergraduates in any major the opportunity to apply to an accelerated master’s degree program in English with a concentration in linguistics. If accepted, students will be able to earn an undergraduate degree in their chosen major and a graduate degree in English with a concentration in linguistics after satisfactory completion of 144 credits, sometimes within five years.

**Undergraduates in Graduate Courses**

The English Department permits qualified undergraduates to enroll in its graduate courses numbered 500 through 699. They may apply these credits to their undergraduate degree or mark them for reserve graduate credit. See the department for details on how to register.

**Writing Center**

The Writing Center offers one-on-one conferencing during all stages of the writing process. Writing Center tutors, who are graduate teaching assistants in the English Department, have been trained in current methods of composition instruction. They help clients overcome writing anxiety, develop organizational and revision skills, and learn useful strategies for editing their own work. To learn more about the Writing Center services or to schedule an appointment, students should consult the Writing Center website.

**Northern Virginia Writing Project**

The Northern Virginia Writing Project (NVWP) is an inservice organization dedicated to improving the writing of Northern Virginia students, kindergarten through university level. Each summer, selected teachers attend an intensive five-week institute where they demonstrate successful teaching techniques, study research on the teaching of writing, and write. After the summer institute, participants return to their schools, colleges, and universities to lead workshops and in-service seminars for other teachers. NVWP is an affiliate of the National Writing Project and one of the seven sites of the Virginia Writing Project.

**Graduate Programs**
The department offers graduate programs in the study and practice of literature and writing, as well as course work in related fields such as folklore, film, linguistics, and cultural studies. The master's degree in English provides concentrations in literature, cultural studies, professional writing and rhetoric, the teaching of writing and literature, and linguistics. The department also has a terminal degree, the MFA in creative writing, with concentrations in fiction, poetry, and nonfiction.

The department offers graduate certificates in folklore, professional writing and rhetoric, and teaching English as a second language. Students may take these as stand-alone certificates or pursue them concurrently with a graduate degree program. Part of the course work for a certificate may be able to be applied to a degree. Students must apply and be admitted to a graduate certificate program.

Faculty from the department coordinate the concentration in folklore studies in the master’s degree in interdisciplinary studies (MAIS). See the Interdisciplinary Studies (MAIS) section of this chapter for details.

Funding

The department offers teaching assistantships and fellowships awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students awarded assistantships must show satisfactory progress toward their degree.

Undergraduate Degree

English, BA

Banner Code: LA-BA-ENGL

Web: english.gmu.edu

This program of study is offered by the Department of English.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in English must complete additional college requirements for the BA degree degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 30 credits (nine courses) in English beyond ENGH 302 with a minimum GPA of 2.00. Student majoring in English are required to complete at least 6 credits at the 400 level.

300-level courses teach the foundational principles for a field of study, include courses of broad scope, and provide an introduction to a genre, literary period, or methodology.

400-level courses provide an in-depth approach to a field of study, a single genre, literary period, or methodology. They include special topics classes and English honors classes. Some 400 level courses require ENGH 305 as a prerequisite.

Students choose one of 13 concentrations or an emphasis in comparative literature.

Students should consult with an English Department advisor to learn ways in which the university-wide general education requirements can also satisfy college-level requirements or the English major.

BA in English with a concentration
One required course (6 credits)

- ENGH 305 - Dimensions of Writing and Literature Credits: 6

Four core courses (12 credits)

Courses taken to fulfill this requirement may simultaneously satisfy a concentration. Special topics courses, when relevant, may be used to fulfill this requirement with the prior written approval of the department.

One course (3 credits) in literature before 1800 chosen from:

- ENGH 320 - Literature of the Middle Ages Credits: 3
- ENGH 321 - English Poetry and Prose of the 16th Century Credits: 3
- ENGH 322 - Shakespeare Credits: 3
- ENGH 323 - Shakespeare Credits: 3
- ENGH 324 - English Renaissance Drama Credits: 3
- ENGH 325 - English Poetry and Prose of the 17th Century Credits: 3
- ENGH 330 - Augustan Age: 1660-1745 Credits: 3
- ENGH 331 - Age of Sensibility: 1745-1800 Credits: 3
- ENGH 332 - Restoration and 18th Century Drama Credits: 3
- ENGH 333 - British Novel of the 18th Century Credits: 3
- ENGH 421 - Medieval Literature in Context Credits: 3
- ENGH 422 - Chaucer Credits: 3
- ENGH 424 - Spenser Credits: 3
- ENGH 428 - Milton Credits: 3

One course (3 credits) in literature before 1915 chosen from courses listed above and the following courses:

- ENGH 334 - British Poetry of the Romantic Period Credits: 3
- ENGH 335 - Prose and Poetry of the Victorian Period Credits: 3
- ENGH 336 - British Novel of the 19th Century Credits: 3
- ENGH 340 - Early American Literature Credits: 3
- ENGH 341 - Literature of the American Renaissance Credits: 3
- ENGH 343 - Development of the American Novel to 1914 Credits: 3
- ENGH 348 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGH 349 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGH 360 - Continental Fiction, 1770-1880 Credits: 3

One course (3 credits) in minority, folkloric, or popular literary and cultural traditions chosen from:
• ENGH 310 - Topics: Women and Literature Credits: 3
• ENGH 315 - Folklore and Folklife Credits: 3
• ENGH 319 - Popular Culture Credits: 3
• ENGH 348 - Beginnings of African American Literature Through 1865 Credits: 3
• ENGH 349 - African American Literature: Reconstruction to 1903 Credits: 3
• ENGH 350 - African American Literature Through 1946 Credits: 3
• ENGH 351 - Contemporary African American Literature Credits: 3
• ENGH 352 - Topics in Ethnic American Literature Credits: 3
• ENGH 362 - Global Voices Credits: 3
• ENGH 366 - The Idea of a World Literature Credits: 3
• ENGH 367 - World Literatures in English Credits: 3
• ENGH 412 - Topics in Folklore Studies Credits: 3
• ENGH 414 - Folklore of the Spirit World Credits: 3
• ENGH 415 - Folk Arts and Folk Artists Credits: 3
• ENGH 416 - Ethnicity and Migration in Folklore Credits: 3
• ENGH 419 - Topics in Popular Literature Credits: 3
• ENGH 451 - Science Fiction Credits: 3
• ENGH 452 - Critical Study of Children's Literature Credits: 3

One elective course (3 credits) above ENGH 302

Four courses (12 credits) in one concentration

Special topics courses may be used to fulfill the requirements for a concentration when so designated by department.

▲ Concentration in American Literature (ALIT)

Four courses (12 credits) chosen from:

• ENGH 315 - Folklore and Folklife Credits: 3
• ENGH 340 - Early American Literature Credits: 3
• ENGH 341 - Literature of the American Renaissance Credits: 3
• ENGH 343 - Development of the American Novel to 1914 Credits: 3
• ENGH 344 - Development of the American Novel since 1914 Credits: 3
• ENGH 345 - American Drama of the 20th Century Credits: 3
• ENGH 346 - American Poetry of the 20th Century Credits: 3
• ENGH 348 - Beginnings of African American Literature Through 1865 Credits: 3
• ENGH 349 - African American Literature: Reconstruction to 1903 Credits: 3
• ENGH 350 - African American Literature Through 1946 Credits: 3
• ENGH 351 - Contemporary African American Literature Credits: 3
• ENGH 352 - Topics in Ethnic American Literature Credits: 3
• ENGH 355 - Recent American Fiction Credits: 3
• ENGH 356 - Recent American Poetry Credits: 3
- ENGH 416 - Ethnicity and Migration in Folklore Credits: 3
- ENGH 441 - Topics: American Authors Credits: 3

▲ Concentration in Creative Writing (CW)

Four courses (12 credits) chosen from:

- ENGH 377 - Digital Creative Writing Credits: 3
- ENGH 397 - Poetry Writing Credits: 3
- ENGH 398 - Fiction Writing Credits: 3
- ENGH 399 - Creative Nonfiction Writing Credits: 3
- ENGH 492 - Advanced Fiction Writing Workshop Credits: 3
- ENGH 494 - Advanced Poetry Writing Workshop Credits: 3
- ENGH 497 - Topics in Creative Writing Credits: 3

▲ Concentration in Cultural Studies (CULT)

Four courses (12 credits) chosen from:

- ENGH 308 - Introduction to Literary Theory Credits: 3
- ENGH 310 - Topics: Women and Literature Credits: 3
- ENGH 315 - Folklore and Folklife Credits: 3
- ENGH 318 - Introduction to Cultural Studies Credits: 3
- ENGH 319 - Popular Culture Credits: 3
- ENGH 348 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGH 349 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGH 350 - African American Literature Through 1946 Credits: 3
- ENGH 351 - Contemporary African American Literature Credits: 3
- ENGH 352 - Topics in Ethnic American Literature Credits: 3
- ENGH 362 - Global Voices Credits: 3
- ENGH 372 - Introduction to Film Credits: 3
- ENGH 412 - Topics in Folklore Studies Credits: 3
- ENGH 414 - Folklore of the Spirit World Credits: 3
- ENGH 415 - Folk Arts and Folk Artists Credits: 3
- ENGH 416 - Ethnicity and Migration in Folklore Credits: 3
- ENGH 418 - Cultural Constructions of Sexualities Credits: 3
- ENGH 419 - Topics in Popular Literature Credits: 3
- ENGH 452 - Critical Study of Children's Literature Credits: 3
- ENGH 474 - Topics in Film/Media Studies Credits: 3

May include one course from outside the English Department chosen from:
• COMM 465 - Topics in Communication and Gender Credits: 3
• CULT 320 - Globalization and Culture Credits: 3
• PSYC 362 - Psychology of Women Credits: 3
• SOCI 315 - Women and Men in Society Credits: 3
• WMST 300 - Current Issues in Women and Gender Studies Credits: 1-6
• WMST 330 - Theoretical Perspectives in Women and Gender Studies Credits: 3

▲ Concentration in Drama (DRA)

A maximum of one course (3 credits) may be from courses on Shakespeare.

Four courses (12 credits) chosen from:

• ENGH 322 - Shakespeare Credits: 3
• ENGH 323 - Shakespeare Credits: 3
• ENGH 324 - English Renaissance Drama Credits: 3
• ENGH 332 - Restoration and 18th Century Drama Credits: 3
• ENGH 339 - British and Irish Drama after 1900 Credits: 3
• ENGH 345 - American Drama of the 20th Century Credits: 3
• ENGH 368 - Modern Drama Credits: 3
• ENGH 455 - Topics in Drama Credits: 3

May include one course from outside the English Department chosen from:

• RUSS 407 - Russian Drama and Theater Credits: 3
• SPAN 565 - Studies in Spanish American Drama Credits: 3
• THR 350 - Script Analysis Credits: 3
• THR 351 - Dramatic Theory and Criticism Credits: 3
• THR 352 - Dramatic Literature Seminar Credits: 3
• THR 380 - Playwriting I Credits: 3
• THR 381 - Playwriting II Credits: 3

▲ Concentration in Fiction (FIC)

Three courses (9 credits) chosen from:

• ENGH 333 - British Novel of the 18th Century Credits: 3
• ENGH 336 - British Novel of the 19th Century Credits: 3
• ENGH 338 - British Novel after 1900 Credits: 3
• ENGH 343 - Development of the American Novel to 1914 Credits: 3
• ENGH 344 - Development of the American Novel since 1914 Credits: 3
• ENGH 355 - Recent American Fiction Credits: 3
• ENGH 361 - Continental Fiction, 1880-1950 Credits: 3
• ENGH 398 - Fiction Writing Credits: 3
• ENGH 451 - Science Fiction Credits: 3
• ENGH 452 - Critical Study of Children's Literature Credits: 3
• ENGH 453 - Topics in Fiction Credits: 3

One course (3 credits) in fiction before 1915 chosen from:

• ENGH 333 - British Novel of the 18th Century Credits: 3
• ENGH 336 - British Novel of the 19th Century Credits: 3
• ENGH 343 - Development of the American Novel to 1914 Credits: 3
• ENGH 360 - Continental Fiction, 1770-1880 Credits: 3

▲ Concentration in Film and Media Studies (FILM)

Four courses (12 credits) chosen from:

• ENGH 318 - Introduction to Cultural Studies Credits: 3
• ENGH 370 - Introduction to Documentary Credits: 3
• ENGH 372 - Introduction to Film Credits: 3
• ENGH 376 - Rhetoric and New Media Credits: 3
• ENGH 470 - Topics in Film/Media History Credits: 3
• ENGH 472 - Topics in Film/Media Theory Credits: 3
• ENGH 474 - Topics in Film/Media Studies Credits: 3

May include one course from outside the English Department chosen from:

• ARTH 362 - Twentieth-Century European Art Credits: 3
• ARTH 373 - Studies in 20th-Century Art of the United States Credits: 3
• ARTH 374 - Art Now Credits: 3
• COMM 380 - Media Criticism Credits: 3
• COMM 465 - Topics in Communication and Gender Credits: 3
• MUSI 301 - Music in Motion Pictures Credits: 3
• RUSS 470 - Topics in (Post) Soviet Film Credits: 3

▲ Concentration in Folklore, Mythology, and Literature (FML)
At least two courses (6 credits) in folklore and mythology chosen from:

- ENGH 315 - Folklore and Folklife Credits: 3
- ENGH 316 - Topics in Myth and Literature Credits: 3
- ENGH 384 - Writing Ethnography Credits: 3
- ENGH 412 - Topics in Folklore Studies Credits: 3
- ENGH 414 - Folklore of the Spirit World Credits: 3
- ENGH 415 - Folk Arts and Folk Artists Credits: 3
- ENGH 416 - Ethnicity and Migration in Folklore Credits: 3
- ENGH 459 - Internship Credits: 1-3
- ENGH 591 - Topics in Folklore Studies Credits: 3

May include one course from outside the English Department chosen from:

- ANTH 450 - Qualitative Methods: Nonstatistical Approaches in Culture and Social Research Credits: 3
- CLAS 340 - Greek and Roman Epic Credits: 3

Up to two courses (6 credits) related to folklore and mythology chosen from:

- ENGH 318 - Introduction to Cultural Studies Credits: 3
- ENGH 320 - Literature of the Middle Ages Credits: 3
- ENGH 322 - Shakespeare Credits: 3
- ENGH 323 - Shakespeare Credits: 3
- ENGH 339 - British and Irish Drama after 1900 Credits: 3
- ENGH 348 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGH 349 - African American Literature: Reconstruction to 1903 Credits: 3
- ENGH 350 - African American Literature Through 1946 Credits: 3
- ENGH 351 - Contemporary African American Literature Credits: 3
- ENGH 362 - Global Voices Credits: 3
- ENGH 422 - Chaucer Credits: 3
- ENGH 424 - Spenser Credits: 3
- ENGH 428 - Milton Credits: 3

May include one course from outside the English Department chosen from:

- ANTH 301 - Native North Americans Credits: 3
- ANTH 302 - Peoples and Cultures of Latin America Credits: 3
- ANTH 304 - Peoples and Cultures of the Pacific Credits: 3
- ANTH 306 - Peoples and Cultures of Island Asia Credits: 3
- ANTH 307 - Ancient Mesoamerica Credits: 3
- ANTH 308 - Peoples and Cultures of the Middle East Credits: 3
- ANTH 311 - Peoples and Cultures of Mainland Southeast Asia Credits: 3
• ANTH 313 - Myth, Magic, and Mind Credits: 3
• ANTH 332 - Cross-cultural perspectives on globalization Credits: 3
• ARTH 319 - Art and Archaeology of the Ancient Near East Credits: 3
• ARTH 321 - Greek Art and Archaeology Credits: 3
• ARTH 322 - Roman Art and Archaeology Credits: 3
• ARTH 340 - Early Renaissance Art in Italy, 1300-1500 Credits: 3
• ARTH 342 - High Renaissance Art in Italy, 1480–1570 Credits: 3
• ARTH 345 - Northern Baroque Art, 1600-1750 Credits: 3
• ARTH 382 - Arts of India Credits: 3
• ARTH 383 - Arts of Southeast Asia Credits: 3
• ARTH 384 - Arts of China Credits: 3
• ARTH 385 - Arts of Japan Credits: 3

▲ Concentration in Linguistics (LING)

One required course (3 credits):

• LING 306 - General Linguistics Credits: 3

Three courses (9 credits) chosen from:

• LING 307 - English Grammar Credits: 3
• LING 450 - Introduction to Sociolinguistics Credits: 3
• LING 485 - Semantics and Pragmatics Credits: 3
• LING 486 - Syntax I Credits: 3
• LING 490 - Generative Phonology Credits: 3
• LING 499 - Independent Study Credits: 1-3
• LING 507 - Field Work in Applied Linguistics Credits: 3
• LING 521 - Applied Linguistics: Teaching English as a Second Language Credits: 3
• LING 523 - English Phonetics Credits: 3
• LING 581 - Psycholinguistics Credits: 3
• LING 582 - Second Language Acquisition Credits: 3

▲ Concentration in Medieval and Renaissance Literature (MRL)

Four courses (12 credits) chosen from:

• ENGH 320 - Literature of the Middle Ages Credits: 3
• ENGH 321 - English Poetry and Prose of the 16th Century Credits: 3
• ENGH 322 - Shakespeare Credits: 3
• ENGH 323 - Shakespeare Credits: 3
• ENGH 324 - English Renaissance Drama Credits: 3
• ENGH 325 - English Poetry and Prose of the 17th Century Credits: 3
- ENGH 421 - Medieval Literature in Context Credits: 3
- ENGH 422 - Chaucer Credits: 3
- ENGH 424 - Spenser Credits: 3
- ENGH 426 - Studies in Shakespeare Credits: 3
- ENGH 428 - Milton Credits: 3

May include one course from outside the English Department chosen from:

- ARTH 333 - Early Christian and Byzantine Art Credits: 3
- ARTH 334 - Western Medieval Art Credits: 3
- ARTH 340 - Early Renaissance Art in Italy, 1300-1500 Credits: 3
- ARTH 341 - Northern Renaissance Art Credits: 3
- ARTH 342 - High Renaissance Art in Italy, 1480–1570 Credits: 3
- ARTH 344 - Baroque Art in Italy, France, and Spain, 1600–1750 Credits: 3
- ARTH 345 - Northern Baroque Art, 1600-1750 Credits: 3
- HIST 304 - Western Europe in the Middle Ages Credits: 3
- HIST 305 - The Renaissance Credits: 3
- HIST 306 - The Reformation Credits: 3
- PHIL 302 - History of Western Philosophy: Medieval Credits: 3
- RELI 371 - Classic Jewish Texts Credits: 3

▲ Concentration in Modern British Literature (MBL)

Four courses (12 credits) chosen from:

- ENGH 330 - Augustan Age: 1660-1745 Credits: 3
- ENGH 331 - Age of Sensibility: 1745-1800 Credits: 3
- ENGH 332 - Restoration and 18th Century Drama Credits: 3
- ENGH 333 - British Novel of the 18th Century Credits: 3
- ENGH 334 - British Poetry of the Romantic Period Credits: 3
- ENGH 335 - Prose and Poetry of the Victorian Period Credits: 3
- ENGH 336 - British Novel of the 19th Century Credits: 3
- ENGH 337 - British Poetry after 1900 Credits: 3
- ENGH 338 - British Novel after 1900 Credits: 3
- ENGH 339 - British and Irish Drama after 1900 Credits: 3

▲ Concentration in Writing and Rhetoric (WRTR)

Four courses (12 credits) chosen from:
- ENGH 375 - Web Authoring and Design Credits: 3
- ENGH 376 - Rhetoric and New Media Credits: 3
- ENGH 382 - Writing Nonfiction Genres Credits: 3
- ENGH 384 - Writing Ethnography Credits: 3
- ENGH 386 - Editing for Audience, Style, and Voice Credits: 3
- ENGH 388 - Professional and Technical Writing Credits: 3
- ENGH 399 - Creative Nonfiction Writing Credits: 3
- ENGH 459 - Internship Credits: 1-3
- ENGH 486 - Writing Nonfiction for Publication Credits: 3
- ENGH 488 - Topics in Writing and Rhetoric Credits: 3
- ENGH 503 - Theory and Practice of Editing Credits: 3
- ENGH 504 - Internship Credits: 1-6
- ENGH 505 - Document Design Credits: 3

▲ Concentration in Poetry (POE)

Four courses (12 credits) chosen from:

- ENGH 320 - Literature of the Middle Ages Credits: 3
- ENGH 321 - English Poetry and Prose of the 16th Century Credits: 3
- ENGH 322 - Shakespeare Credits: 3
- ENGH 323 - Shakespeare Credits: 3
- ENGH 325 - English Poetry and Prose of the 17th Century Credits: 3
- ENGH 330 - Augustan Age: 1660-1745 Credits: 3
- ENGH 334 - British Poetry of the Romantic Period Credits: 3
- ENGH 335 - Prose and Poetry of the Victorian Period Credits: 3
- ENGH 337 - British Poetry after 1900 Credits: 3
- ENGH 346 - American Poetry of the 20th Century Credits: 3
- ENGH 356 - Recent American Poetry Credits: 3
- ENGH 397 - Poetry Writing Credits: 3
- ENGH 422 - Chaucer Credits: 3
- ENGH 454 - Topics in Poetry Credits: 3

▲ Concentration in World Literature (WLIT)

At least two courses (6 credits) chosen from:

Special topics courses, when relevant, may be applied to this concentration when designated by the department.

- ENGH 360 - Continental Fiction, 1770-1880 Credits: 3
- ENGH 361 - Continental Fiction, 1880-1950 Credits: 3
- ENGH 362 - Global Voices Credits: 3
- ENGH 366 - The Idea of a World Literature Credits: 3
- ENGH 367 - World Literatures in English Credits: 3
- ENGH 368 - Modern Drama Credits: 3

2 additional courses (6 credits)

Courses may be chosen from the list above or the lists below, but no more than one course can be chosen from each of the lists below.

One course chosen from designated concentrations

Students can choose up to one course (3 credits) from courses listed under the concentrations above in Medieval and Renaissance literature, American literature, or Modern British literature.

Up to one course chosen from:

Students may apply up to one course from this list to the WLIT concentration when the topic is relevant, subject to the approval of the department.

- ANTH 300 - Civilizations Credits: 3
- CULT 320 - Globalization and Culture Credits: 3
- HIST 308 - Nineteenth-Century Europe Credits: 3
- HIST 309 - Europe in Crisis: 1914-1948 Credits: 3
- HIST 387 - Topics in Global History Credits: 3
- CHIN 310 - Survey of Chinese Literature Credits: 3
- CHIN 311 - Modern Chinese Literature in Translation Credits: 3
- CHIN 325 - Major Chinese Writers Credits: 3
- CHIN 328 - Asian American Women Writers Credits: 3
- FRLN 330 - Topics in World Literature Credits: 3
- FREN 325 - Major French Writers Credits: 3
- FREN 329 - Problems of Western Civilization in French Literature Credits: 3
- GERM 325 - Major Writers Credits: 3
- JAPA 320 - Japanese Cinema Credits: 3
- RUSS 325 - Major Russian Writers Credits: 3
- RUSS 326 - A Survey of Russian Literature Credits: 3
- RUSS 327 - A Survey of Russian Literature Credits: 3
- SPAN 325 - Major Hispanic Writers Credits: 3
- SPAN 329 - Special Topics in Spanish and Latin American Literature Credits: 3

BA in English with a Comparative Literature Emphasis

The English Department and the Modern and Classical Languages Department offer a BA in English with an emphasis in comparative literature. This program combines the study of literature in English with the study of one or more foreign literatures and with cross-cultural literary study. It requires 10 courses above ENGH 302. Students should consult with their advisor to design a program of study that best suits their particular interests and goals.

Two required courses (6 credits)
• CL 300 - Introduction to Comparative Literature Credits: 3
• CL 514 - Theories of Comparative Literature Credits: 3

One course (3 credits) in literary criticism chosen from:

Students choose a course appropriate for their focus.

• ENGH 305 - Dimensions of Writing and Literature Credits: 6
• FREN 381 - Introduction to Literary Analysis Credits: 3

Two courses (6 credits) in English or American literature

Two courses (6 credits) in literature other than English or American

Students meet this requirement with courses in a literature other than English or American, either in translation or, for those pursuing foreign language study, with selected readings in the original language.

Three courses (9 credits) in comparative or world literature

Comparative or world literature courses are designated by the comparative literature committee and generally selected in consultation with the advisor every semester. Examples are:

• various 300-level CLAS courses
• FRLN 330 courses
• Special topics courses, when relevant, in ENGH, FREN, GERM, RUSS, SPAN, or other language
• ENGH 366 - The Idea of a World Literature Credits: 3
• ENGH 421 - Medieval Literature in Context Credits: 3
• ENGH 360 - Continental Fiction, 1770-1880 Credits: 3
• ENGH 361 - Continental Fiction, 1880-1950 Credits: 3
• ENGH 367 - World Literatures in English Credits: 3

Total: 30 credits

Writing Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in English fulfill this requirement by successfully completing ENGH 325. Students doing the comparative literature emphasis who do not take ENGH 325 will have to meet the synthesis requirement with another non-English course.
Undergraduate Interdisciplinary Minor

Film and Media Studies Minor

Banner Code: FILM

Phone: 703-993-2768
Web: fams.gmu.edu

Faculty

Christensen, Fuchs (director), Gibson, Landsberg, Lont, Ricouart, Roan, Sample, Scarlata, Winkler

It is obvious that movies, television, and the Internet have become an important part of everyday life. However, we don't think of them as "serious" in the way traditional academic subjects are, though ironically they have much greater impact on our lives. If you want to know how these media really work, how they move and inspire us, and how they purvey certain ideas of race, class, gender, and sexuality -- or if you're just fascinated by them and want to understand the basis of your fascination -- consider a minor in film and media studies. This minor is a great adjunct to virtually any major, especially for students contemplating careers in education or communication.

The interdisciplinary minor in film and media studies explores mass culture in its visual manifestations and helps students develop an informed awareness of culture and media, ideological tendencies, and effects on daily experience. Committed to interdisciplinary studies, the program addresses the increasing complexity and multiplicity of visual cultures and offers students the tools with which to read a variety of texts, including film, television, video, and new media.

Most course work is offered through the Departments of Communication and English, with other courses available through the Department of Modern and Classical Languages and the Program in Film and Video Studies. The two required courses provide an introduction to the languages of film and popular media and modes of analysis appropriate to each. They are prerequisites for all advanced work in the minor. Students select four additional courses designed to introduce a more specialized level of study. Students may decide to focus on film, television, or the study of mass culture, or they may choose some mix of courses that suits their interests.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits of coursework with a minimum GPA of 2.0.

Two required courses (6 credits)

- ENGH 372 - Introduction to Film Credits: 3
- COMM 380 - Media Criticism Credits: 3

Four elective courses (12 credits):
Students need prior written approval of the FAMS director to apply these courses to the minor: ENGH 318, 319, 418, 419, 499 and FREN 470. FREN 470 also requires permission of the instructor. ENGH 470, 472, and 474 may be repeated for credit and applied to the minor if the topic is different.

COMM and AVT majors can only use 6 elective credits from their home department toward the FAMS minor.

Choose 12 credits from:

- CHIN 320 - Contemporary Chinese Film Credits: 3
- COMM 302 - Foundations of Mass Communication Credits: 3
- COMM 350 - Mass Communication and Public Policy Credits: 3
- COMM 355 - Video Principles and Practices Credits: 3
- COMM 358 - Video Producing and Directing Credits: 3
- COMM 360 - Video Editing Credits: 3
- COMM 364 - Videography Credits: 3
- COMM 365 - Gender, Race, and Class in the Media Credits: 3
- COMM 366 - Visual Communication Credits: 3
- COMM 452 - Media Production Practicum Credits: 3
- COMM 456 - Comparative Mass Media Credits: 3
- ENGH 318 - Introduction to Cultural Studies Credits: 3 (with permission of director)
- ENGH 370 - Introduction to Documentary Credits: 3
- ENGH 319 - Popular Culture Credits: 3 (with permission of director)
- ENGH 418 - Cultural Constructions of Sexualities Credits: 3 (with permission of director)
- ENGH 470 - Topics in Film/Media History Credits: 3
- ENGH 472 - Topics in Film/Media Theory Credits: 3
- ENGH 474 - Topics in Film/Media Studies Credits: 3
- ENGH 419 - Topics in Popular Literature Credits: 3 (with permission of director)
- ENGH 499 - Independent Study Credits: 1-6  (with permission of director)
- FAVS 365 - Documentary Filmmaking I Credits: 3
- FAVS 399 - Special Topics in Film and Video Studies Credits: 1-3
- FREN 470 - French and Francophone Cinema Credits: 3 (with permission of director and instructor)
- FRLN 331 - Topics in World Cinema Credits: 3
- JAPA 320 - Japanese Cinema Credits: 3
- RUSS 470 - Topics in (Post) Soviet Film Credits: 3

Total: 18 credits

Folklore and Mythology Minor

Banner Code: FOLK

Phone: 703-993-1172
Web: folkloreprograms.gmu.edu

Faculty
Stories told in both sacred and secular contexts, along with festivals, foods, music, material objects, and other traditional art forms, continue to influence our lives. This interdisciplinary minor offers students tools to explore the compelling meanings within these seemingly simple, everyday cultural texts, and helps them become more aware of the ways these texts are used by individuals and institutions for various goals. Students study folklore and mythology by juxtaposing the multiple viewpoints of anthropology, art history, classical studies, literary studies, and religious studies.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

**Course Work**

Students pursuing this minor must complete 18 credits with a minimum GPA of 2.00. A course used to fulfill the 3 credits of literature required for general education may not also be applied to the minor. To avoid duplication of courses, English majors who choose the folklore and mythology interdisciplinary minor may not select the English Department’s folklore, mythology, and literature concentration.

**One course (3 credits) chosen from:**

- ARTH 102 - Symbols and Stories in Art Credits: 3
- CLAS 250 - Classical Mythology Credits: 3
- DANC 118 - World Dance Credits: 3 (when the topic is Afro-Cuban dance)
- RELI 100 - The Human Religious Experience Credits: 3
- RELI 211 - Religions of the West Credits: 3
- RELI 212 - Religions of Asia Credits: 3

**Four to five courses (12 to 15 credits) chosen from:**

- ANTH 427 - Historic Cemetery Survey Credits: 4
- ANTH 450 - Qualitative Methods: Nonstatistical Approaches in Culture and Social Research Credits: 3
- ARTH 319 - Art and Archaeology of the Ancient Near East Credits: 3
- ARTH 321 - Greek Art and Archaeology Credits: 3
- ARTH 322 - Roman Art and Archaeology Credits: 3
- ARTH 382 - Arts of India Credits: 3
- ARTH 383 - Arts of Southeast Asia Credits: 3
- ARTH 384 - Arts of China Credits: 3
- ARTH 385 - Arts of Japan Credits: 3
- ARTH 399 - Special Topics in the History of Art Credits: 3 (when the topic is Medieval Irish art and culture)
- ARTH 482 - Advanced Studies in Asian Art Credits: 3 (when the topic is monuments and memory)
- CLAS 340 - Greek and Roman Epic Credits: 3
- CLAS 350 - Greek and Roman Tragedy Credits: 3
- CLAS 390 - Topics in Classical Literature and Culture Credits: 3 (when the topic is the Odyssey in film)
• ENGH 384 - Writing Ethnography Credits: 3
• ENGH 315 - Folklore and Folklife Credits: 3
• ENGH 316 - Topics in Myth and Literature Credits: 3
• ENGH 453 - Topics in Fiction Credits: 3 (when the topic is literary fairy tales)
• ENGH 416 - Ethnicity and Migration in Folklore Credits: 3
• ENGH 414 - Folklore of the Spirit World Credits: 3
• ENGH 415 - Folk Arts and Folk Artists Credits: 3
• ENGH 412 - Topics in Folklore Studies Credits: 3
• RELI 401 - Death and the Afterlife in World Religions Credits: 3

At most one course (3 credits) of independent study or internship chosen from:

• Summer field work schools offered by the American Folklife Center at the Library of Congress or other institution approved by faculty and taken for credit
• ANTH 299 - Independent Study Credits: 1-3
• ANTH 495 - Internship Credits: 1-6
• ARTH 393 - Art History Internships Credits: 3-6
• ARTH 490 - Independent Study in Art History Credits: 3
• ARTH 491 - Independent Study in Art History Credits: 3
• ENGH 459 - Internship Credits: 1-3 (when this is an approved internship in folklore)
• ENGH 499 - Independent Study Credits: 1-6

Total: 18 credits

Linguistics Minor

Banner Code: LING

Phone: 703-993-1188
Web: linguistics.gmu.edu

Faculty

Goldin, Holisky, Jones, Leeman, Levine, McCarthy, Roman-Mendoza, Weinberger (director), Wulf

Linguistics is the scientific study of language. Language is studied descriptively, theoretically, computationally, and psychologically, and as a social phenomenon. The field of linguistics thus informs and is informed by many other areas of study, including philosophy, psychology, sociology, computer science, the study of individual languages and literatures, literary studies, and education.

The interdisciplinary minor in linguistics may be combined with a major in one of the areas listed above or in any other field. This minor introduces the fundamental concepts of modern linguistic theory and explores how these concepts relate to various other disciplines.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.
For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

One core course (3 credits) in general linguistics

- LING 306 - General Linguistics Credits: 3

One course (3 credits) in syntactic theory, phonological theory, or linguistic semantics

Choose one of the following:

- LING 486 - Syntax I Credits: 3
- LING 490 - Generative Phonology Credits: 3
- LING 485 - Semantics and Pragmatics Credits: 3

Three elective courses (9 credits)

Other elective courses, when topic is relevant, may be applied to the minor with the prior written approval of the director.

- Any LING course
- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- FRLN 380 - Topics in the Sociopolitics of Language Credits: 3
- FRLN 385 - Multilingualism, Identity, and Power Credits: 3
- LING 307 - English Grammar Credits: 3
- LING 450 - Introduction to Sociolinguistics Credits: 3
- LING 499 - Independent Study Credits: 1-3
- Any foreign language course beyond 210

Total: 15 credits

Native American and Indigenous Studies Minor

Banner Code: NAIS

Web: english.gmu.edu
Native American and indigenous studies is an interdisciplinary field of study committed to understanding both the unity and the diversity of present and past Native American tribes, cultures, and experiences. This interdisciplinary minor will help students think critically and respectfully about the complex dynamics of Native American cultures, considered both individually and comparatively. In addition to practicing and developing critical thinking and writing skills, students in this interdisciplinary minor will learn how value systems operate in different cultures, examine the roots of conflict and resolution across a broad historical and cultural spectrum, better understand the importance of language as a means of cultural expression, and heighten their appreciation of the unique status of present-day Native American tribes as nations with certain sovereign powers within the boundaries of the United States.

In addition to a required course that introduces key concepts, events, figures, and methodological approaches, students take five 3-credit elective courses from no fewer than three departments. The course work for this minor enables students to examine Native American cultures from a variety of disciplinary perspectives, including those that are anthropological, historical, artistic, philosophical, and political.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

No more than two courses from a single department can be applied to the minor. No more than 3 credits can be applied to both university general education requirements and the minor.

Students pursuing this minor must complete 18 credits in coursework with a minimum GPA of 2.0.

One required course (3 credits)

- NAIS 201 - Introduction to Native American and Indigenous Studies Credits: 3

Five elective courses (15 credits) chosen from:

Special topics courses and summer field work offerings, when relevant, may be used to fulfill elective credits for the minor with prior written approval of the director.

- ANTH 301 - Native North Americans Credits: 3
- ANTH 302 - Peoples and Cultures of Latin America Credits: 3
- ANTH 307 - Ancient Mesoamerica Credits: 3
- ANTH 399 - Issues in Anthropology Credits: 3
- ANTH 428 - Patterns in Prehistory Credits: 3
- ENGH 384 - Writing Ethnography Credits: 3
- ENGH 315 - Folklore and Folklife Credits: 3
- HIST 391 - History of Virginia to 1800 Credits: 3
Undergraduate Minor

English Minor

Banner Code: ENGL

Web: english.gmu.edu

A minor in English provides students with a strong background in writing and critical thinking, as well as introducing them to significant literary and cultural documents. Prerequisite for the minor in English is satisfaction of the 3-credit university-wide general education requirement in literature.

The minor must be approved by the English Department undergraduate advisor before graduation.

This program of study is offered by the Department of English.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing the minor in English must complete 18 credits with a minimum GPA of 2.00. ENGH 305 is not required for the minor but is strongly encouraged. ENGH 302 may not be applied to the minor.

One to two courses (3-6 credits) in 200-level literature courses chosen from:

- ENGH 201 - Reading and Writing about Texts Credits: 3
- ENGH 202 - Texts and Contexts Credits: 3
- ENGH 203 - Western Literary Tradition Credits: 3
- ENGH 204 - Western Literary Traditions Credits: 3

Four to five courses (12-15 credits) in 300 or 400 level ENGH courses

Students have the option of choosing courses to form a focus for the minor. Examples include: American literature, British literature, creative writing, cultural studies, drama, fiction, film and media studies, folklore, literary criticism, poetry, and world
literature. Students should consult with the English undergraduate advisor to design a minor program to meet their educational goals and interests. (ENGH 302 may not be applied to the minor.)

Total: 18 credits

Teaching English as a Second Language Minor

Banner Code: TESL

Web: linguistics.gmu.edu

The minor in teaching English as a second language (TESL) helps prepare undergraduate students to teach nonnative speakers of English in the United States or abroad. This course of study combines linguistic theory, second language acquisition theory, and ESL teaching methodology.

The minor in TESL may be pursued concurrently with any undergraduate major. English majors concentrating in linguistics can apply up to 9 credits in LING used for the major to the TESL minor.

This program of study is offered by the Department of English.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits of coursework with a minimum GPA of 2.0.

Five required courses (15 credits)

Students must have approval from the director to register for 500-level courses.

- LING 306 - General Linguistics Credits: 3
- LING 307 - English Grammar Credits: 3
- LING 521 - Applied Linguistics: Teaching English as a Second Language Credits: 3
- LING 523 - English Phonetics Credits: 3
- LING 582 - Second Language Acquisition Credits: 3

One elective course (3 credits) chosen from:

Other relevant courses may be applied to the minor with the prior written approval of the director. Students must have approval from the director to register for 500-level courses.

- Any course in a foreign language beyond the college requirement for the BA degree
- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- ENGH 318 - Introduction to Cultural Studies Credits: 3
- LING 450 - Introduction to Sociolinguistics Credits: 3
• LING 485 - Semantics and Pragmatics Credits: 3
• LING 486 - Syntax I Credits: 3
• LING 490 - Generative Phonology Credits: 3
• LING 499 - Independent Study Credits: 1-3
• LING 525 - Practicum in ESL Credits: 3

Total: 18 credits

Writing and Rhetoric Minor

Banner Code: WRTR

Web: english.gmu.edu

The minor in writing and rhetoric provides students with opportunities to learn and apply advanced strategies for writing academic, professional, and civic documents. Students examine the theoretical, interdisciplinary, and professional aspects of writing and develop their expository, persuasive, organizational, and stylistic skills through close analysis of rhetorical situations and the features and approaches of successful writing. The strong communication and analytical skills developed while earning this minor contribute to student success in a wide variety of professional careers as well as graduate education.

The minor in writing and rhetoric is a valuable asset for students interested in working in media organizations, trade and professional associations, and non-profit organizations related to the arts, schools, and social change. It is also beneficial to students interested in careers in business, science, engineering, accounting, and many others that demand strong writing and communication skills for promotion and advancement.

Course Work

Students pursuing this minor must complete 15 credits of coursework with a minimum GPA of 2.00.

One required course (3 credits)

• ENGH 380 - Introduction to Writing and Rhetoric Credits: 3

One core course (3 credits) chosen from:

• ENGH 382 - Writing Nonfiction Genres Credits: 3
• ENGH 388 - Professional and Technical Writing Credits: 3

Three elective courses (9 credits)
Students may choose all three electives in ENGH or optionally take one elective course (3 credits) from outside the department.

Three elective ENGH courses (9 credits) chosen from:

- ENGH 375 - Web Authoring and Design Credits: 3
- ENGH 382 - Writing Nonfiction Genres Credits: 3
- ENGH 384 - Writing Ethnography Credits: 3
- ENGH 386 - Editing for Audience, Style, and Voice Credits: 3
- ENGH 388 - Professional and Technical Writing Credits: 3
- ENGH 459 - Internship Credits: 1-3
- ENGH 486 - Writing Nonfiction for Publication Credits: 3
- ENGH 488 - Topics in Writing and Rhetoric Credits: 3

Two elective ENGH courses (6 credits) and one (3 credits) from outside the department chosen from:

Students choose two courses from list above and one from list below.

- AVT 395 - Writing for Artists Credits: 3
- CHSS 390 - Peer Tutoring in Writing across the Disciplines Credits: 1 (take 3 times)
- COMM 303 - Writing across the Media Credits: 3
- COMM 320 - Business and Professional Communication Credits: 3
- NCLC 349 - Writing for Multimedia Credits: 4

Total: 15 credits

Bachelor's/Accelerated Master's Program

Bachelor's Degree (any) /English, Accelerated MA (Linguistics Concentration)

Web: linguistics.gmu.edu

Highly qualified Mason undergraduates in any major may apply to the accelerated master’s degree in English with a concentration in linguistics. If accepted, students will be able to earn a BA in their chosen major and an MA in English with a concentration in linguistics after satisfactory completion of 144 credits.

This program of study is offered by the Department of English.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.
Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in English (linguistics concentration), see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. Upon completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

Master’s Degree

Creative Writing, MFA

Banner Code: LA-MFA-CW

Web: creativewriting.gmu.edu

The master of fine arts in creative writing has three concentrations: poetry, fiction, and nonfiction. Students should apply to only one concentration, although a student turned down by one concentration may subsequently apply to another or to that same concentration in a subsequent year.

Students interested in taking individual courses or in applying in the future to the MFA program are welcome to apply to take classes as non degree students; such enrollments are allowed only with the instructor’s permission. Students already admitted as non degree students who are interested in taking a specific creative writing course should submit a brief letter of introduction and a writing sample to the professor at least one week before the start of classes. Students who are not already admitted as non degree students first need to apply for non degree status. Students who have been denied admission to the MFA program may not take courses as non degree students.

This program of study is offered by the Department of English.
For policies governing all master's degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MFA in creative writing, see Application Requirements and Deadlines on the departmental web site.

Reduction of Credit

With the approval of the MFA faculty, the program director, and the dean, the number of credits required for an MFA may be reduced by a maximum of 20 credits on the basis of graduate course work before admission.

Degree Requirements

Two to four courses (6 to 12 credits) in literature

Students should choose courses in consultation with an advisor. ENGH 798 may not be used to fulfill this requirement.

One Concentration (12 to 15 credits)

▲ Concentration in Fiction (FIC)

Students in this concentration complete 12 credits.

One course (3 credits) in the form

- ENGH 566 - Forms of Fiction Credits: 3

Writing workshops (9 credits)

- ENGH 618 - Fiction Writing Workshop Credits: 1-6
- ENGH 751 - Advanced Workshop in Fiction Writing Credits: 1-6

▲ Concentration in Nonfiction Writing (NFW)

Students in this concentration complete 15 credits.
One required course (3 credits)

Students should enroll the first semester it is offered after they enter the program.

- ENGH 506 - Research for Narrative Writing Credits: 3

One course (3 credits) in the form

- ENGH 565 - Forms of Nonfiction Credits: 3

Writing workshops (9 credits)

- ENGH 616 - Nonfiction Writing Workshop Credits: 1-6
- ENGH 752 - Advanced Workshop in Nonfiction Writing Credits: 1-6

▲Concentration in Poetry (POE)

Students in this concentration complete 15 credits.

One course (3 credits) in the form

- ENGH 564 - Form of Poetry Credits: 3

Writing workshops (9 credits)

- ENGH 617 - Poetry Writing Workshop Credits: 1-6
- ENGH 750 - Advanced Workshop in Poetry Writing Credits: 3

At least one course (3 credits) in another genre (fiction or nonfiction)

This requirement may be filled by a section of ENGH 608 in another genre.

Elective courses (up to 15 credits)

Electives should be chosen in consultation with the writing program faculty. The number of electives will vary according to the number of literature courses and workshops that students take.

Craft Seminars (6 to 12 credits)
This course can be repeated for credit.

- **ENGH 608 - Craft Seminars** Credits: 3

**Workshop (1 credit)**

- **ENGH 699 - Workshop in English** Credits: 1-3

**Exam or Project**

**Exam**

Students in poetry must pass a written MFA exam based on the authors they have chosen. The authors are selected in collaboration with the writing faculty any time after completing 12 credits of course work and before completing 32 credits. The exam must be completed at least one semester before the student registers for the final 3 credits of thesis.

Students in fiction and nonfiction writing must pass an MFA exam or complete an MFA project. Students who elect to take the MFA exam select, after the completion of 18 credits and with the approval of their faculty advisors, a list of authors and an area of emphasis (for example, the European novel).

**Project**

Students in fiction and nonfiction writing must pass an MFA exam or complete an MFA project. Students who elect to complete an MFA project (such as editing an anthology) must carry out the project under the direction of a faculty member and may register for ENGH 798 to fulfill this requirement. The project must be completed at least one semester before the student registers for the final 3 credits of thesis.

- **ENGH 798 - Directed Reading and Research** Credits: 1-6

**Thesis (6 credits)**

ENGH 798 may not be used as thesis preparation. Students who want to register for thesis credits in the summer need the permission of the thesis committee.

Students should be aware of the university policies governing theses. They must follow the thesis enrollment policy and once enrolled in ENGH 799, maintain continuous enrollment. These policies are specified in the Academic Policies chapter of the catalog.

- **ENGH 799 - Thesis** Credits: 1-6

**Total: 48 credits**
English, MA

Banner Code: LA-MA-ENGL

Web: english.gmu.edu

This program of study is offered by the Department of English.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in English, see Application Requirements and Deadlines on the departmental web site.

Satisfactory Progress

Students have six years to complete the MA. Students writing a thesis must have an approved proposal by the end of their fifth year as an MA candidate in English and may not make significant changes to that proposal during their sixth year. By the end of the first semester of their sixth year, thesis students need to demonstrate that they have completed their research and are well advanced in developing their analysis and argument, generally by submitting to their advisors a completed rough draft of the thesis or evidence that they have completed their fieldwork and analysis. A student may be dropped from the program if, in the judgment of the thesis advisor and graduate director, evidence of satisfactory progress on the thesis has not been provided by the end of the first semester of a student’s sixth year.

Degree Requirements

Students pursuing this degree must successfully complete 30 to 33 credits in one concentration as specified below and demonstrate proficiency in a foreign language.

Foreign Language Proficiency

Students in all concentrations must demonstrate proficiency in a foreign language by course work equivalent to Mason’s foreign language course FRLN 210 or by passing a translation test administered by the department.

▲ Concentration in Cultural Studies (CULT)

Three required courses (9 credits):

- ENGH 676 - Introduction to Cultural Studies Credits: 3
- ENGH 701 - Research in English Studies Credits: 3
- CULT 802 - Histories of Cultural Studies Credits: 3
Two courses (6 credits) chosen from:

ENGH 685, 705, and 740 may be repeated once with permission of the director of graduate studies.

- ENGH 551 - Literary Criticism Credits: 3
- ENGH 555 - Introduction to Cinema Studies Credits: 3
- ENGH 665 - Texts in Global Contexts Credits: 3
- ENGH 670 - Visual Culture: Theories and Histories Credits: 3
- ENGH 675 - Feminist Theory and Criticism Credits: 3
- ENGH 685 - Selected Topics, Movements, or Genres of Literature in English Credits: 3
- ENGH 705 - Literary Theory and Criticism Credits: 3
- ENGH 740 - Seminar in English/Cultural Studies Credits: 3

Three to five courses (9-15 credits) of literature

Project or Thesis (3 or 6 credits) (optional)

Project (3 credits)

Students who choose a project take 3 fewer credits of literature.

- ENGH 790 - Projects in Literary Studies Credits: 3

Thesis (6 credits)

Students who choose a thesis take 6 fewer credits of literature.

- ENGH 799 - Thesis Credits: 1-6

Total: 30 credits

▲ Concentration in Linguistics (LING)

The linguistics concentration of the MA in English combines courses in linguistics with courses in some related area of language study, such as teaching English as a second language, bilingual education, or foreign language teaching. This course of study is designed to prepare students for teaching in one of these fields or for doctoral work. The certificate in teaching English as a second language (TESL) can be earned concurrently.
Six core courses (18 credits):

- LING 690 - Generative Phonology Credits: 3
- LING 691 - Theories of Language Credits: 3
- LING 692 - Phonology II Credits: 3
- LING 785 - Semantics and Pragmatics Credits: 3
- LING 786 - Syntax I Credits: 3
- LING 787 - Syntax II Credits: 3

Four elective courses (12 credits)

In consultation with an advisor, chosen from courses that reflect one or more areas of language study. Electives can be in such areas as linguistics, the teaching of reading or writing, literary criticism, bilingual education, or a foreign language, and may include 6 credits of thesis.

Total: 30 credits

▲ Concentration in Literature (LIT)

Two required courses (6 credits)

Must be taken in the first twelve credits of the degree. Another course in literary theory and criticism may substitute for ENGH 551 with prior written approval of the graduate director.

- ENGH 551 - Literary Criticism Credits: 3
- ENGH 701 - Research in English Studies Credits: 3

Four to six courses (12-18 credits) of literature

Two elective courses (6 credits)

Elective courses taught within the English department may be taken without permission of the graduate director. A maximum of 6 credits of related study outside the department may substitute for the equivalent number of elective credits, with permission of the graduate director.

Project or Thesis (3 or 6 credits) (optional)

Project (3 credits)
Students who choose a project take 3 fewer credits of literature.

- ENGH 790 - Projects in Literary Studies Credits: 3

Thesis (6 credits)

Students who choose a thesis take 6 fewer credits of literature.

- ENGH 799 - Thesis Credits: 1-6

Total: 30 credits

▲ Concentration in Professional Writing and Rhetoric (PWR)

Two required courses (6 credits):

- ENGH 501 - Introduction to Professional Writing and Rhetoric Credits: 3
- ENGH 502 - Research Methods in Rhetoric and Professional Writing Credits: 3

Two courses (6 credits) in professional writing and rhetoric

One course (3 credits) in writing, nonfiction, or professional writing and rhetoric

One course (3 credits) in theory chosen from:

- ENGH 514 - Theories of Comparative Literature Credits: 3
- ENGH 551 - Literary Criticism Credits: 3
- ENGH 675 - Feminist Theory and Criticism Credits: 3
- ENGH 705 - Literary Theory and Criticism Credits: 3
- ENGH 676 - Introduction to Cultural Studies Credits: 3

Two or three elective courses in English (6-9 credits)

Project or Thesis (3 or 6 credits)
3 credits of project

Students who choose a project take one additional elective course of 3 credits.

- ENGH 797 - Projects in Professional Writing and Rhetoric Credits: 3

6 credits of thesis

- ENGH 799 - Thesis Credits: 1-6

Total: 30 credits

▲ Concentration in the Teaching of Writing and Literature (TWL)

One required course (3 credits):

- ENGH 701 - Research in English Studies Credits: 3

Two courses (6 credits) in writing

Two courses (6 credits) in literature

One course (3 credits) in linguistics

Students usually fulfill this requirement by taking:

- LING 522 - Modern English Grammar Credits: 3

Two courses (6 credits) in the teaching of writing and in the teaching of literature

Students usually fulfill this requirement by taking:

- ENGH 615 - Proseminar in Composition Instruction Credits: 3
- ENGH 610 - Proseminar in Teaching the Reading of Literature Credits: 3
One course (3 credits) in composition theory:

- ENGH 697 - Composition Theory Credits: 3
  or an appropriate section of
- ENGH 611 - Studies in Rhetoric Credits: 3

Up to one elective course (3 credits) in literature or writing

Students who choose to do a project or thesis will take project or thesis credits in place of this requirement.

Project or Thesis (3-6 credits) (optional)

Project (3 credits)

Students who choose a project take 3 fewer elective credits in literature or writing.

- ENGH 790 - Projects in Literary Studies Credits: 3

Thesis (6 credits)

Students may arrange to do a thesis working with an advisor and the director of graduate studies in English. Students who pursue this option take 3 fewer elective credits in literature or writing. They must complete 33 (rather than 30) credits to receive their degree.

- ENGH 799 - Thesis Credits: 1-6

Total: 30-33 credits

Total: 30-33 credits

Most students complete 30 credits. Students in the concentration in the teaching of writing and literature who chose to do a thesis complete 33 credits.

Master's Level Certificate

Folklore Studies Graduate Certificate

Banner Code: LA-CERG-FLKS
The certificate in folklore studies enables students to explore the processes of tradition that move through multiple expressive forms, such as folktales, folk beliefs, folk medicine, folk art, folksong, and literature. A discipline based on ethnographic fieldwork, folklore studies offers students a chance to work in communities and collect living traditional materials that are critical to human identity and values. Interdisciplinary by nature, folklore thrives on local particularities as well as compelling global connections.

This certificate prepares students for careers in cultural agencies, governmental organizations, and teaching institutions, and advanced study in folklore and in the humanities.

This program of study is offered by the Department of English.

The graduate certificate in folklore studies may be pursued on a part-time or full-time basis.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in folklore studies, see Application Requirements and Deadlines on the departmental web site.

**Certificate Requirements**

The topics courses ENGH 590, 591, and 681 may be repeated for credit when the subtitles are different.

12 credits chosen from:

- ENGH 590 - Topics in Folk Narrative Credits: 3
- ENGH 591 - Topics in Folklore Studies Credits: 3
- ENGH 681 - Advanced Topics in Folklore Studies Credits: 3
- ENGH 798 - Directed Reading and Research Credits: 1-6
- ANTH 750 - Ethnographic Genres Credits: 3

One research course (3 credits) chosen from:

- ENGH 701 - Research in English Studies Credits: 3
- HIST 610 - The Study and Writing of History Credits: 3
- SOCI 634 - Qualitative Research Methods Credits: 3

One elective course (3 credits)

Students choose a relevant elective with the prior written approval of the director.

**Total: 18 credits**
Professional Writing and Rhetoric Graduate Certificate

Banner Code: LA-CERG-PWR

Web: english.gmu.edu

The graduate certificate in professional writing and rhetoric provides students with course work in nonfiction writing in specific genres, current writing practices and theories of writing in organizational settings, research methods in professional writing, and nonfiction literature.

The certificate may be pursued concurrently with any of several programs in English and elsewhere. Part of the course work toward the certificate may be applied to those degrees with the approval of the director of the degree program.

This program of study is offered by the Department of English.

For policies governing all certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in professional writing and rhetoric may only be pursued on a part-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in professional writing and rhetoric, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Students pursuing this certificate must complete 18 credits of English graduate courses with a minimum grade of 3.00 in each course.

One core course (3 credits)

- ENGH 501 - Introduction to Professional Writing and Rhetoric Credits: 3

One research methods course (3 credits)

- ENGH 502 - Research Methods in Rhetoric and Professional Writing Credits: 3

Two courses (6 credits) in professional writing and rhetoric chosen from:

- ENGH 503 - Theory and Practice of Editing Credits: 3
- ENGH 504 - Internship Credits: 1-6
• ENGH 505 - Document Design Credits: 3
• ENGH 508 - Digital Rhetoric Credits: 3
• ENGH 611 - Studies in Rhetoric Credits: 3
• ENGH 612 - Cultures of Professional Writing Credits: 3
• ENGH 613 - Technical Communication Credits: 3
• ENGH 697 - Composition Theory Credits: 3

One course (3 credits) in writing, nonfiction, or professional writing and rhetoric

One elective course (3 credits)

Students choose an elective from ENGH courses in consultation with an advisor.

Total: 18 credits

Teaching English as a Second Language Graduate Certificate

Banner Code: LA-CERG-TESL

Web: linguistics.gmu.edu

The graduate certificate in teaching English as a second language (TESL) prepares students to teach non-native speakers of English in the United States or abroad. Certificate courses fulfill, in part, requirements for an endorsement in English as a second language to the Virginia state teaching credential. Students who want to earn this endorsement should consult with an advisor.

The certificate may be pursued concurrently with any of several degree programs offered through the College of Education and Human Development, the English Department, and the Modern and Classical Languages Department. Part of the course work toward the certificate may be applied toward degrees in those departments.

This program of study is offered by the Department of English.

For policies governing all graduate certificates, see the Academic Policies chapter of this catalog.

The graduate certificate in teaching English as a second language may be pursued on a part-time or full-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in teaching English as a second language, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Students pursuing this certificate must complete 18 credits, earning a minimum grade of 3.00 in each course.
Six required courses (18 credits)

- LING 520 - Introduction to Linguistics Credits: 3
- LING 521 - Applied Linguistics: Teaching English as a Second Language Credits: 3
- LING 522 - Modern English Grammar Credits: 3
- LING 523 - English Phonetics Credits: 3
- LING 525 - Practicum in ESL Credits: 3
- LING 582 - Second Language Acquisition Credits: 3

Total: 18 credits

Doctoral Degree

Linguistics, PhD

Banner Code: LA-PHD-LING

Web: linguistics.gmu.edu

The PhD in linguistics trains students in the science of language. Students become specialists in the core areas of linguistics—phonology, syntax, and semantics—and learn to integrate this core with the study of second language acquisition. This 72-credit degree program prepares students for positions in academia, industry, and government working in a host of organizations that are concerned with language and second language acquisition. They might be research and teaching professors, administrators of language-learning programs, or consultants in computational linguistic research.

This program of study is offered by the Department of English.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the PhD in linguistics, see Application Requirements and Deadlines on the departmental web site.

Reduction of Credit

For students entering the doctoral program with a master’s degree, the number of required credits may be reduced by a maximum of 30 credits, subject to approval of the program faculty and the dean. Requests for reduction of credit are reviewed only after acceptance to the doctoral program.

Degree Requirements
To receive the PhD, students complete a minimum of 72 credits of course work including a dissertation. Students must submit two qualifying papers in linguistics.

**Eleven core courses (33 credits) in linguistics**

**Three courses (9 credits) in phonology**

- LING 690 - Generative Phonology Credits: 3
- LING 692 - Phonology II Credits: 3
- LING 890 - Advanced Phonology Seminar Credits: 3

**Three courses (9 credits) in syntax**

- LING 786 - Syntax I Credits: 3
- LING 787 - Syntax II Credits: 3
- LING 886 - Advanced Syntax Seminar Credits: 3

**Two courses (6 credits) in semantics/pragmatics**

- LING 785 - Semantics and Pragmatics Credits: 3
- LING 788 - Semantics and Pragmatics II Credits: 3

**Two courses in (6 credits) in language acquisition chosen from:**

- LING 582 - Second Language Acquisition Credits: 3
- LING 782 - Second Language Acquisition II Credits: 3
- LING 882 - Seminar in Language Acquisition Credits: 3

**One course (3 credits) in research methodology**

- LING 770 - Research Methods Credits: 3
Two seminars (6 credits)

Students take two seminar courses in two chosen fields. Seminar topics change every time they are offered. They may be repeated for credit.

- LING 882 - Seminar in Language Acquisition Credits: 3
- LING 886 - Advanced Syntax Seminar Credits: 3
- LING 890 - Advanced Phonology Seminar Credits: 3

Five elective courses (15 credits) chosen from:

- LING 507 - Field Work in Applied Linguistics Credits: 3
- LING 521 - Applied Linguistics: Teaching English as a Second Language Credits: 3
- LING 522 - Modern English Grammar Credits: 3
- LING 523 - English Phonetics Credits: 3
- LING 525 - Practicum in ESL Credits: 3
- LING 581 - Psycholinguistics Credits: 3
- LING 650 - Introduction to Sociolinguistics Credits: 3
- LING 691 - Theories of Language Credits: 3
- LING 798 - Directed Reading and Research Credits: 1-3
- ENGH 592 - Historical Studies of the English Language Credits: 3
- FREN 575 - Grammatical Analysis Credits: 3
- FRLN 565 - Theory of Translation Credits: 3
- SOCI 636 - Statistical Reasoning Credits: 3
- SPAN 500 - History of the Spanish Language Credits: 3
- SPAN 501 - Applied Spanish Grammar Credits: 3
- SPAN 502 - Hispanic Sociolinguistics Credits: 3
- PSYC 615 - Language Development Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3
- CSI 600 - Quantitative Foundations for Computational Sciences Credits: 3
- CSS 600 - Introduction to Computational Social Science Credits: 3
- NEUR 604 - Ethics in Scientific Research Credits: 1-3
- EDUC 611 - Cultural Issues in Second Language Acquisition Credits: 3
- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 569 - Teaching English in the Secondary School Credits: 3

Two qualifying papers (6 credits)

Students register for this course twice.

- LING 898 - Advanced Qualifying Seminar Credits: 3

Doctoral Dissertation (minimum 12 credits):
Once enrolled in 999, students must follow the university's continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students apply to this degree a minimum of 12 dissertation credits (998 and 999 combined) with at least 3 credits of 999. Because of the continuous registration policy, students may be required to register for additional credits of these courses.

- LING 998 - Doctoral Dissertation Proposal Credits: 1-6
- LING 999 - Doctoral Dissertation Credits: 1-12

Total: 72 credits

Global Affairs

Phone: 703-993-9185
Web: globalaffairs.gmu.edu

Course Work

The Global Affairs program offer all course work designated GLOA in the Courses chapter of this catalog.

Undergraduate Program

Faculty


Bachelor's Degree

The bachelor's degree in global affairs is a transdisciplinary major that introduces students to the global processes affecting all societies. Drawing on the broad international expertise of Mason faculty, this program incorporates courses from across the university. Global affairs majors examine transnational and international processes in a wide range of areas including politics, economics, culture, peace and conflict, and the environment. Through the concentration of their choice, they have the opportunity to study specific regions and languages and investigate the ways particular parts of the world experience and influence global processes.

Global affairs majors take a common set of core courses and choose a concentration. They can focus on a theme (global economy, international development, the environment, etc.) or a world region (Africa, Asia, Latin America, etc.).

Students are strongly encouraged to take advantage of Mason's many study abroad courses and do an internship as part of their degree program.

Honors in the Major
Highly qualified students may pursue advanced work leading to graduation with honors in the major. Global Affairs majors who have completed 75 credits with an overall GPA of 3.50 and a GPA of 3.50 in courses for the major are eligible to apply to graduate with honors.

Students pursuing honors in the major must complete a two-course honors sequence GLOA 491 and GLOA 492 with a minimum GPA of 3.50 in the sequence. Not all applicants who meet the minimum requirements are guaranteed acceptance.

Global Affairs with a Second Major or Minor

Students can complement their major in global affairs with a second major. Students interested in this option are encouraged to discuss their plans with advisors in both majors. See the section on Credit for More than One Undergraduate Major in the Academic Policies chapter of the catalog.

Students majoring in global affairs are encouraged to complement their major one of the many minors offered by the college. See the Minors and Interdisciplinary Minors section of this chapter.

Minor

The undergraduate program in global affairs offers a minor in global affairs, which is available to students in any major in the university.

Graduate Program

Faculty

Bakhash, Kelly (director), Lyons, Mandaville, Shaklee, Wilsford

Master's Degree

The master's degree in global affairs is an interdisciplinary program that offers students the opportunity to engage in advanced study of a broad range of international global issues.

Bachelor’s/Accelerated Master’s Program

Highly qualified undergraduates in any major are invited to apply to the accelerated master’s degree program in global affairs. If accepted, students will be able to earn an undergraduate degree in their chosen major and a graduate degree in global affairs after satisfactory completion of 144 credits, often within five years.

Undergraduate Degree

Global Affairs, BA

Banner Code: LA-BA-GLOA

Web: globalaffairs.gmu.edu
Global affairs is a transdisciplinary major that introduces students to the global processes affecting all societies. Students in this program are encouraged to participate in study abroad opportunities and internships. They can complement their major with a second major or a minor.

This program of study is offered by the Global Affairs program.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in global affairs must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 36 credits with a minimum cumulative GPA of 2.00. Students must have a minimum grade of 2.00 in each of the core courses and a minimum grade of 1.67 in each of the courses used to fulfill the concentration and the language requirement for global affairs majors. Students who major in global affairs may not also earn the minor in global systems or receive credit for ECON 390.

Six core courses (18 credits):

- GLOA 101 - Introduction to Global Affairs Credits: 3
- SOCI 120 - Globalization and Society Credits: 3
- CONF 340 - Global Conflict Analysis and Resolution Credits: 3
- CULT 320 - Globalization and Culture Credits: 3
- ECON 385 - International Economic Policy Credits: 3
- EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- GOVT 322 - International Relations Theory Credits: 3 (Note the prerequisite for this course: GOVT 132 or 133.)

6-9 credits of language study beyond intermediate proficiency

To fulfill this requirement, students can continue the study of one language beyond the intermediate proficiency level (required for all BA degrees in the college) or choose to study other languages. After a student has demonstrated intermediate proficiency in one language, the remainder of the requirement may be fulfilled by taking any courses taught in a foreign language, at any level. Students are required to complete:

- 9 credits beyond the completion of 210 or the receipt of heritage language waiver
- 6 credits beyond the completion of 202

Four courses (12 credits) in an approved concentration

Courses applied to a global affairs concentration must come from at least two different departments. Concentration courses must be unique to the concentration: they cannot be simultaneously used to fulfill any general education requirement or college requirement for the bachelor's degree. They cannot be applied to any other major, minor, concentration, or certificate.

In addition to the courses listed below, other relevant courses, including special topics courses, study abroad, and internships (maximum 3 credits), may be applied to a concentration with prior written approval from the director.
By Global Topic

▲ The Environment (EVT)

Students may complete this concentration through 12 credits of regular coursework or through the Smithsonian-Mason Semester Program (16 credits).

Regular Coursework

Choose 12 credits from the following:

- ANTH 370 - Environment and Culture Credits: 3
- BIOL 301 - Biology and Society Credits: 3
- ECON 335 - Environmental Economics Credits: 3 (Note the prerequisites for this course: ECON 103, 104.)
- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 336 - Human Dimensions of the Environment Credits: 3
- EVPP 377 - Applied Ecology Credits: 3
- GEOL 309 - Introduction to Oceanography Credits: 3
- GGS 302 - Global Environmental Hazards Credits: 3
- GGS 303 - Conservation of Resources and Environment Credits: 3
- GGS 311 - Introduction to Geographic Information Systems Credits: 3
- GOVT 361 - Introduction to Environmental Policy Credits: 3
- PHIL 343 - Topics in Environmental Philosophy Credits: 3
- TOUR 312 - Ecotourism Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3

Total: 12 credits

Smithsonian-Mason Semester Program

Students complete 16 credits offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian National Zoo Smithsonian Conservation Biology Institute. There are two tracks that a student can complete and apply to the concentration: the Semester whose focus is on "Applied Conservation Strategies", or the Semester that focuses on "Ecology for Effective Conservation Practice". Students take the courses in a given track together in one semester, living on site at the institute in Front Royal, VA. Students who apply this coursework to the concentration cannot also apply it to the minor in Applied Conservation Studies.

Applied Conservation Strategies track

- CONS 320 - Conservation in Practice Credits: 3
- CONS 401 - Conservation Theory Credits: 3
- CONS 402 - Applied Conservation Credits: 4
- CONS 410 - Human Dimensions in Conservation Credits: 3
- CONS 490 - Integrated Conservation Strategies Credits: 3

Ecology for Effective Conservation Practice track

- CONS 320 - Conservation in Practice Credits: 3
- CONS 403 - Ecology and Conservation Theory Credits: 3
- CONS 404 - Monitoring and Assessment of Biodiversity Credits: 4
- CONS 411 - Science Communication for Conservation Credits: 3
- CONS 491 - Comprehensive Conservation Planning Credits: 3

Total: 16 credits

▲ Global Communications and Technology (GCT)

This concentration addresses the historic trends and recent explosion of technological innovation that now connects people across the world and provides them instantaneous information. Students particularly interested in communication, psychology, and information technology should consider this concentration.

Choose 12 credits from the following:

- ANTH 332 - Cross-cultural perspectives on globalization Credits: 3
- ANTH 395 - Work, Technology, and Society: An IT Perspective Credits: 3
- COMM 202 - Media and Society Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- COMM 306 - Issues in Intercultural Communication Credits: 3
- COMM 307 - Field Study in Communication Credits: 3
- COMM 350 - Mass Communication and Public Policy Credits: 3
- COMM 375 - Mass Communication Advertising and Promotions Credits: 3
- COMM 412 - Politics and the Mass Media Credits: 3
- COMM 431 - Information Technology and the Political Process Credits: 3
- COMM 456 - Comparative Mass Media Credits: 3
- COMM 506 - Communication in International Organizations Credits: 3
- HIST 455 - History of Print Journalism Credits: 3
- IT 223 - Information Security Fundamentals Credits: 3
- IT 300 - Modern telecommunications Credits: 3
- IT 341 - Data Communications and Network Principles Credits: 3
- IT 353 - Information Defense Technologies Credits: 3
- IT 366 - Network Security I Credits: 3
- IT 462 - Information Security Principles Credits: 3
- IT 488 - Fundamentals of Satellite Communications Credits: 3
- PSYC 379 - Applied Cross-Cultural Psychology Credits: 3
- or other course approved by the program director
Total: 12 credits

▲ Global Economy and Management (GEM)

In this concentration, students explore marketing, managing, and developing world economies. Students interested in economics, business, and management should consider this concentration.

Choose 12 credits from the following:

- ECON 360 - Economics of Developing Areas Credits: 3
- ECON 361 - Economic Development of Latin America Credits: 3
- ECON 362 - African Economic Development Credits: 3
- ECON 380 - Economies in Transition Credits: 3
- FNAN 440 - International Financial Management Credits: 3
- GOVT 343 - International Political Economy Credits: 3
- IT 304 - IT in the Global Economy Credits: 3
- MGMT 461 - Cross Cultural and Global Management Credits: 3
- MKTG 407 - International Marketing Credits: 3
- MSOM 302 - Managing Information in a Global Environment Credits: 3
- MSOM 303 - Marketing in a Global Economy Credits: 3
- MSOM 305 - Managing in a Global Economy Credits: 3
- NCLC 423 - Management in the Global Marketplace Credits: 6
- BULE 302 - Legal Environment of Business Credits: 3
- BULE 402 - Commercial Law Credits: 3
- or other course approved by the program director

Note:

BULE courses require the approval of the director.

Total: 12 credits

▲ Global Governance (GLGV)

In this concentration students explore how national governments, international organizations, and non-governmental organizations work together to identify, understand, and address global issues. Coursework covers diplomacy, international law and organizations, international security, and conflict resolution.

Choose 12 credits from the following:

- ANTH 312 - Political Anthropology Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- CRIM 405 - Law and Justice around the World Credits: 3
- CRIM 475 - Theory and Politics of Terrorism Credits: 3
- GGS 301 - Political Geography Credits: 3
- GOVT 342 - Diplomacy Credits: 3
- GOVT 343 - International Political Economy Credits: 3
- GOVT 344 - American Foreign Policy Credits: 3
- GOVT 347 - International Security Credits: 3
- GOVT 412 - Politics and the Mass Media Credits: 3
- GOVT 445 - Human Rights Credits: 3
- GOVT 446 - International Law and Organization Credits: 3
- GOVT 447 - Revolution and International Politics Credits: 3
- GOVT 448 - Ethics and International Politics Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-6
- SOCI 340 - Power, Politics, and Society Credits: 3
- or other course approved by the program director

Total: 12 credits

▲ Global Inequalities and Responses (GIR)

This concentration provides students with a historical perspective regarding international issues such as stratification, gender roles, race relations, and social movements. Students interested in government, anthropology, sociology, and women and gender studies should consider this concentration.

Choose 12 credits from the following:

- ANTH 365 - Race and Racism Credits: 3
- ANTH 488 - Gender, Sexuality, and Culture Credits: 3
- CRIM 405 - Law and Justice around the World Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 307 - Sustainable Development Credits: 3
- GOVT 414 - Politics of Race and Gender Credits: 3
- HIST 366 - Comparative Slavery Credits: 3
- NCLC 304 - Social Movements and Community Activism Credits: 4
- SOCI 307 - Social Movements and Political Protest Credits: 3
- SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
- SOCI 315 - Women and Men in Society Credits: 3
- SOCI 355 - Social Inequality Credits: 3
- WMST 100 - Representations of Women Credits: 3
- or other course approved by the program director

Total: 12 credits

▲ International Development (IDEV)
In this concentration, students explore the many facets of development work as practiced by national governments, international organizations, and non-governmental organizations today. Students learn about economic development, environmental conservation, sustainable tourism, democratization, human rights, international ethics, and humanitarian relief.

Choose 12 credits from the following:

- ANTH 331 - Refugees Credits: 3
- ECON 360 - Economics of Developing Areas Credits: 3
- ECON 361 - Economic Development of Latin America Credits: 3
- ECON 362 - African Economic Development Credits: 3
- GCH 205 - International Health Credits: 3
- GGS 303 - Conservation of Resources and Environment Credits: 3
- GOVT 336 - Political Development and Change Credits: 3
- GOVT 434 - Democracy in Global Perspective Credits: 3
- GOVT 445 - Human Rights Credits: 3
- GOVT 446 - International Law and Organization Credits: 3
- HEAL 350 - Interventions for Populations and Communities at Risk Credits: 3
- NCLC 401 - Conservation Biology Credits: 6
- SOCW 351 - Social Policy and Social Justice Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3
- or other course approved by the program director

Total: 12 credits

▲ World Arts (WA)

Choose 12 credits from the following:

- ARTH 203 - Survey of Asian Art Credits: 3
- ARTH 204 - Survey of Latin American Art Credits: 3
- ARTH 362 - Twentieth-Century European Art Credits: 3
- ARTH 380 - African Art Credits: 3
- ARTH 382 - Arts of India Credits: 3
- ARTH 383 - Arts of Southeast Asia Credits: 3
- ARTH 384 - Arts of China Credits: 3
- ARTH 385 - Arts of Japan Credits: 3
- ARTH 386 - The Silk Road Credits: 3
- ARTH 394 - The Museum Credits: 3
- AVT 372 - Hip Hop Culture Credits: 3
- CHIN 311 - Modern Chinese Literature in Translation Credits: 3
- CHIN 320 - Contemporary Chinese Film Credits: 3
- CL 300 - Introduction to Comparative Literature Credits: 3
- DANC 318 - Global Perspectives: World Dance Forms Credits: 3
- DANC 391 - Dance History II Credits: 3
- DANC 418 - Global Dance Intensive Credits: 1-3
- ENGH 315 - Folklore and Folklife Credits: 3
Total: 12 credits

By World Region

▲ Africa (AFR)

This concentration challenges students to understand the historic, economic, social, and political issues confronting all of Africa. Course options include African diaspora experiences. Students interested in art history, French, and government should consider this concentration.

Choose 12 credits from the following:

- ARTH 380 - African Art Credits: 3
- ECON 362 - African Economic Development Credits: 3
- FREN 451 - Topics in Sub-Saharan Francophone Literature and Culture Credits: 3
- GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
- HIST 261 - Survey of African History Credits: 3
- HIST 262 - Survey of African History Credits: 3
- HIST 335 - The African American Experience in the United States: African Background to 1885 Credits: 3
- HIST 336 - The African American Experience in the United States: Reconstruction to the Present Credits: 3
- HIST 360 - History of South Africa Credits: 3

or other course approved by the program director
• HIST 466 - Origins of Conflict in Southern Africa Credits: 3
• or other course approved by the program director

Total: 12 credits

▲ Asia (ASA)

This concentration emphasizes Asia's history and increasingly significant role in contemporary world issues. The courses in this concentration cover the economic, social, and political issues that confront the Pacific, India, China, and mainland Asia. Students interested in anthropology, history, art history, government, and religious studies should consider this concentration.

Choose 12 credits from the following:

• ANTH 304 - Peoples and Cultures of the Pacific Credits: 3
• ANTH 306 - Peoples and Cultures of Island Asia Credits: 3
• ANTH 309 - Peoples and Cultures of India Credits: 3
• ANTH 311 - Peoples and Cultures of Mainland Southeast Asia Credits: 3
• ARTH 203 - Survey of Asian Art Credits: 3
• ARTH 382 - Arts of India Credits: 3
• ARTH 383 - Arts of Southeast Asia Credits: 3
• ARTH 384 - Arts of China Credits: 3
• ARTH 385 - Arts of Japan Credits: 3
• CHIN 310 - Survey of Chinese Literature Credits: 3
• CHIN 311 - Modern Chinese Literature in Translation Credits: 3
• CHIN 328 - Asian American Women Writers Credits: 3
• CHIN 320 - Contemporary Chinese Film Credits: 3
• GOVT 333 - Government and Politics of Asia Credits: 3
• GOVT 341 - Chinese Foreign Policy Credits: 3
• GOVT 433 - Political Economy of East Asia Credits: 3
• HIST 251 - Survey of East Asian History Credits: 3
• HIST 252 - Survey of East Asian History Credits: 3
• HIST 353 - History of Traditional China Credits: 3
• HIST 354 - Modern China Credits: 3
• HIST 356 - Modern Japan Credits: 3
• HIST 357 - Postwar Japan Credits: 3
• JAPA 310 - Japanese Culture in a Global World Credits: 3
• JAPA 320 - Japanese Cinema Credits: 3
• RELI 212 - Religions of Asia Credits: 3
• RELI 313 - Hinduism Credits: 3
• RELI 314 - Chinese Philosophies and Religious Traditions Credits: 3
• RELI 315 - Buddhism Credits: 3
• RELI 317 - Daoism Credits: 3
• or other course approved by the program director

Total: 12 credits
Europe (EU)

This concentration focuses on Europe's long history of art, innovation, and imperialism. Students who are interested in art history, foreign languages, government, history, and philosophy should consider this concentration.

Choose 12 credits from the following:

- ARTH 340 - Early Renaissance Art in Italy, 1300-1500 Credits: 3
- ARTH 360 - Nineteenth-Century European Art Credits: 3
- ARTH 362 - Twentieth-Century European Art Credits: 3
- ENGH 339 - British and Irish Drama after 1900 Credits: 3
- ENGH 361 - Continental Fiction, 1880-1950 Credits: 3
- FREN 325 - Major French Writers Credits: 3
- FREN 470 - French and Francophone Cinema Credits: 3
- GERM 325 - Major Writers Credits: 3
- GERM 340 - Survey of German Literature Credits: 3
- GERM 451 - Modern Literature: 1925 to the Present Credits: 3
- GGS 320 - Geography of Europe Credits: 3
- GOVT 334 - Government and Politics of Europe Credits: 3
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- HIST 304 - Western Europe in the Middle Ages Credits: 3
- HIST 305 - The Renaissance Credits: 3
- HIST 306 - The Reformation Credits: 3
- HIST 307 - Old Regime and Revolutionary Europe Credits: 3
- HIST 308 - Nineteenth-Century Europe Credits: 3
- HIST 309 - Europe in Crisis: 1914-1948 Credits: 3
- HIST 312 - Nationalism in Eastern Europe Credits: 3
- HIST 314 - History of Germany Credits: 3
- HIST 322 - Modern Britain Credits: 3
- HIST 436 - European Society and Culture: 19th and 20th Centuries Credits: 3
- SPAN 321 - Introduction to Spanish Culture Credits: 3
- SPAN 325 - Major Hispanic Writers Credits: 3
- or other course approved by the program director

Total: 12 credits

Latin America (LA)

This concentration provides students with a historical understanding of the economic, social, and political issues of Latin America. Students interested in the anthropology, history, government, or economics of this region should consider this concentration.

Choose 12 credits from the following:

- ANTH 302 - Peoples and Cultures of Latin America Credits: 3
• ANTH 307 - Ancient Mesoamerica Credits: 3
• ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
• ARTH 376 - Twentieth-Century Latin American Art Credits: 3
• ECON 361 - Economic Development of Latin America Credits: 3
• GGS 316 - Geography of Latin America Credits: 3
• GOVT 331 - Government and Politics of Latin America Credits: 3
• HIST 271 - Survey of Latin American History Credits: 3
• HIST 272 - Survey of Latin American History Credits: 3
• HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
• HIST 365 - Conquest and Colonization in Latin America Credits: 3
• HIST 367 - History, Fiction, and Film in Latin America Credits: 3
• or other course approved by the program director

Total: 12 credits

▲ Middle East and North Africa (MNA)

This concentration provides students with an historical perspective on the political, social, and artistic issues in the Middle East and North Africa. Courses include the Arab-Israeli conflict, francophone literature from North Africa, and art and archeology of the ancient Near East. Students interested in the anthropology, history, or religion of this region should consider this concentration.

Choose 12 credits from the following:

• ARTH 319 - Art and Archaeology of the Ancient Near East Credits: 3
• ARTH 320 - Art of the Islamic World Credits: 3
• FREN 453 - Topics in North African Francophone Literature and Culture Credits: 3
• GGS 325 - Geography of North Africa and the Middle East Credits: 3
• GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
• GOVT 345 - Political Islam Credits: 3
• HIST 281 - Survey of Middle Eastern Civilization Credits: 3
• HIST 282 - Survey of Middle Eastern Civilization Credits: 3
• HIST 460 - Modern Iran Credits: 3
• HIST 461 - Arab-Israeli Conflict Credits: 3
• HIST 462 - Women in Islamic Society Credits: 3
• HIST 465 - The Middle East in the 20th Century Credits: 3
• RELI 211 - Religions of the West Credits: 3
• RELI 355 - Sufism Credits: 3
• or other course approved by the program director

Total: 12 credits

▲ North America (NA)
This concentration provides students with insight into the political, economic, social, and artistic history of North America. Students interested in the language, government, or history of this region should consider this concentration.

Choose 12 credits from the following:

- ANTH 301 - Native North Americans Credits: 3
- ARTH 371 - American Architecture and Material Culture Credits: 3
- ARTH 372 - Studies in 18th- and 19th-Century Art of the United States Credits: 3
- ARTH 373 - Studies in 20th-Century Art of the United States Credits: 3
- ENGH 355 - Recent American Fiction Credits: 3
- ENGH 356 - Recent American Poetry Credits: 3
- GGS 315 - Geography of the United States Credits: 3
- GOVT 301 - Public Law and the Judicial Process Credits: 3
- GOVT 307 - Legislative Behavior Credits: 3
- GOVT 308 - The American Presidency Credits: 3
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 420 - American Political Thought Credits: 3
- HIST 331 - Postwar United States, 1945-1973 Credits: 3
- HIST 332 - United States since 1973 Credits: 3
- HIST 336 - The African American Experience in the United States: Reconstruction to the Present Credits: 3
- HIST 350 - U.S. Women's History Credits: 3
- HIST 351 - History of the Old South Credits: 3
- HIST 352 - The South since 1865 Credits: 3
- HIST 370 - War and American Society Credits: 3
- USST 401 - Seminar: The Future of Metropolitan America Credits: 3
- or other course approved by the program director

Total: 12 credits

▲ Russia and Central Asia (RCA)

This concentration focuses on the social, political, and economic climates of Russia and Central Asia historically and today. Students interested in the culture, politics, economics, or history of this region should consider this concentration.

Choose 12 credits from the following:

- ARTH 386 - The Silk Road Credits: 3
- ECON 380 - Economies in Transition Credits: 3
- GGS 330 - Geography of the Soviet Succession States Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
- GOVT 340 - Central Asian Politics Credits: 3
- GOVT 447 - Revolution and International Politics Credits: 3
- HIST 328 - Rise of Russia Credits: 3
- HIST 329 - Modern Russia and the Soviet Union Credits: 3
- HIST 426 - The Russian Revolution Credits: 3
- RUSS 325 - Major Russian Writers Credits: 3
• RUSS 326 - A Survey of Russian Literature Credits: 3
• RUSS 327 - A Survey of Russian Literature Credits: 3
• RUSS 353 - Russian Civilization Credits: 3
• RUSS 354 - Contemporary Post-Soviet Life Credits: 3
• RUSS 407 - Russian Drama and Theater Credits: 3
• RUSS 410 - Russian Poetry Credits: 3
• RUSS 470 - Topics in (Post) Soviet Film Credits: 3
• or other course approved by the program director

Total: 12 credits

▲ Individualized Concentration (IST)

Students interested in creating their own concentration can work with the director or advisor to decide upon a 12 credit curriculum that will fulfill the BA in global affairs.

Writing-Intensive Requirement

The university requires all students to complete at least one course designated as “writing intensive” in their major at the 300 level or above. Students majoring in global affairs should consult the program advisor for courses that can be used to fulfill this requirement.

Total: 36 credits

Undergraduate Minor

Global Affairs Minor

Banner Code: GLOA

Web: gloa.gmu.edu

The minor in global affairs provides students with a global perspective that can enhance many different majors. The minor is not available to students majoring in global affairs or minoring in global systems.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

This program of study is offered by the Global Affairs Program.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work
Students pursuing this minor must complete 15 credits of coursework with a minimum GPA of 2.0.

- GLOA 101 - Introduction to Global Affairs Credits: 3
  or
- SOCI 120 - Globalization and Society Credits: 3

- CULT 320 - Globalization and Culture Credits: 3
- ECON 385 - International Economic Policy Credits: 3
- GOVT 322 - International Relations Theory Credits: 3

- CONF 340 - Global Conflict Analysis and Resolution Credits: 3
  or
- EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3

Total: 15 credits

Bachelor's/Accelerated Master's Program

Bachelor's Degree (any) / Global Affairs, Accelerated MA

Web: globalaffairs.gmu.edu

Highly qualified undergraduates in any major may apply to the accelerated master's degree in global affairs. If accepted, and depending on their undergraduate major, students will be able to earn an undergraduate degree in their chosen major and a graduate degree in global affairs after satisfactory completion of 144 credits, sometimes within five years.

This program of study is offered by the Global Affairs Program.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in global affairs, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. Upon completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.
As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

**Master's Degree**

**Global Affairs, MA**

**Banner Code:** LA-MA-GLOA  
Web: globalaffairs.gmu.edu

The master of arts in global affairs is an interdisciplinary program offering students the opportunity to engage in advanced study of a broad range of international global issues. Students complete a core curriculum that provides the knowledge and skills to think and act globally and then select a specialization. The possible specializations include courses offered by academic departments across the university. All students in the program take part in a residency abroad, typically two weeks in duration, and complete a capstone seminar. Graduates of the program are prepared for careers in a wide variety of international contexts.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

This program of study is offered by the Global Affairs program.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in global affairs, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

Students who wish to study abroad may not use more than 3 credits towards their specialization and must receive approval prior to studying abroad. Students must maintain a 3.0 cumulative grade point average with no more than 2 grades below B. Students pursuing this degree must complete 30 credits distributed as follows:

**Four core courses (12 credits)**
• GLOA 600 - Global Competencies Credits: 3
• GLOA 610 - Economic Globalization and Development Credits: 3
• GLOA 620 - Human Systems Credits: 3
• GLOA 710 - Seminar Abroad Credits: 3

One course (3 credits) chosen from:

• GCH 543 - Global Health Credits: 3
• ITRN 602 - International Financial Institutions and Globalization Credits: 3
• ITRN 603 - International Trade Relations Credits: 3

Specialization (12 credits)

Students choose to specialize in one of eight fields by completing 12 credits in that field selected from the courses listed. The specialization is developed in consultation with an advisor. Students who wish to design their own concentration must submit a one-page proposal and receive written approval from the director. Specialization courses must come from at least two academic disciplines.

Global Conflict and Security

Choose 12 credits from:

• BIOD 610 - Advanced Topics in Biodefense Credits: 1-4 (minimum of 3 credits)
• BIOD 621 - Ethics and International Security Credits: 3
• CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3
• CONF 652 - Conflict Analysis and Resolution for Prevention, Reconstruction, and Stabilization Contexts Credits: 3
• CONF 653 - World Religions, Diplomacy, and Conflict Resolution Credits: 3
• CONF 658 - Diversity and Difference in Conflict Analysis and Resolution Credits: 3
• CONF 659 - Leadership in Conflict Analysis and Resolution Credits: 3
• CONF 736 - Globalization and International Conflict Credits: 3
• CONF 746 - Peace Building Credits: 3
• GOVT 541 - Introduction to Critical Analysis and Strategic Response to Terrorism Credits: 3
• GOVT 640 - Strategic Responses to Terrorism: Coordinated Decision Making Credits: 3
• GOVT 745 - International Security Credits: 3
• ISA 562 - Information Security Theory and Practice Credits: 3
• PUAD 634 - Management of International Security Credits: 3
• PUBP 650 - Peace Operations I Credits: 3
• PUBP 651 - Peace Operations II Credits: 3

Global Culture and Society

Choose 12 credits from:

• ANTH 635 - Regional Ethnography Credits: 3
Global Economics and Development

This specialization is best suited for students with an academic background in economics or for students who have taken microeconomics, macroeconomics, and calculus with a minimum grade of 3.00 in all three.

Choose 12 credits from:

- ECON 611 - Microeconomic Theory Credits: 3
- ECON 612 - Microeconomic Theory II Credits: 3
- ECON 615 - Macroeconomic Theory Credits: 3
- GOVT 743 - International Political Economy Credits: 3
- ITRN 500 - Global Political Economy Credits: 1-4
- ITRN 503 - Investment and Macroeconomics Credits: 1-4
- ITRN 504 - Trade and Microeconomics for International Commerce Credits: 1-4
- ITRN 701 - Special Topics in International Commerce and Policy Credits: 1-3
- ITRN 710 - International Business Transactions: Finance and Investment Credits: 3
- ITRN 718 - Global Economic and Human Development Credits: 3
- ITRN 757 - Business and Politics in Emerging Markets Credits: 3
- ITRN 759 - Country Risk Analysis Credits: 3
- ITRN 767 - Political Economy and Integration in Latin America Credits: 3

Global Education

Choose 12 credits from:

- EDUC 606 - Education and Culture Credits: 3
- EDUC 670 - The Culture of Teaching Credits: 3
- EDUC 671 - Schools and Culture in the Future Credits: 3
Global Governance and Public Management

Choose 12 credits from:

- GOVT 540 - International Relations Credits: 3
- GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3
- GOVT 641 - Seminar in Global Systems Credits: 3
- GOVT 741 - Advanced Seminar in International Politics Credits: 3
- ITRN 701 - Special Topics in International Commerce and Policy Credits: 1-3
- ITRN 761 - European Political and Economic Union Credits: 3
- PUAD 701 - Cross-Cultural and Ethical Dimensions of International Management Credits: 3
- PUBP 502 - Governance and Policy Processes Credits: 1-4
- PUBP 700 - Theory and Practice in Public Policy Credits: 3
- PUBP 725 - International Transportation Logistics Credits: 3
- PUBP 783 - Global Governance Credits: 3

Global Health

Choose 12 credits from:

- GCH 543 - Global Health Credits: 3
- GCH 560 - Environmental Health Credits: 3
- GCH 590 - International Health Organizations Credits: 3
- GCH 602 - Global Health Issues Related to Violence Credits: 3
- GCH 611 - Health Program Planning and Evaluation Credits: 3
- GCH 622 - Mental Health: A Global Perspective Credits: 3
- GCH 640 - Global Infectious Diseases Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3
- PUBP 757 - Public Policy in Global Health and Medical Practice Credits: 3
- PUBP 758 - Global Threats and Medical Policies Credits: 3

Global Media and Information Technology

Choose 12 credits from:

- COMM 506 - Communication in International Organizations Credits: 3
- COMM 630 - Theories of Public Relations Credits: 3
- CS 688 - Pattern Recognition Credits: 3
- INF5 501 - Discrete and Logical Structures for Information Systems Credits: 3
- ITRN 604 - International Trade and Technology Credits: 3
- ITRN 701 - Special Topics in International Commerce and Policy Credits: 1-3
- ITRN 742 - Technology Policy and International Strategies Credits: 3
- PUBP 503 - Culture, Organization, and Technology Credits: 1-4
- PUBP 726 - Telecommunications Policy Credits: 3
- PUBP 736 - International Migration and Public Policy Credits: 3
- TECM 750 - Global IT Management Credits: 2-4

Global Population and Geography

Choose 12 credits from:

- GGS 505 - Transportation Geography Credits: 3
- GGS 550 - Geospatial Science Fundamentals Credits: 3
- GGS 533 - Issues in Regional Geography Credits: 1-6
- GGS 581 - World Food and Population Credits: 3
- GGS 590 - Selected Topics in Geography Credits: 1-3
- GGS 631 - Spatial Agent-Based Models of Human-Environment Interactions Credits: 3
- PUBP 754 - Geographic Information Systems and Spatial Analysis for Public Policy Credits: 3

One capstone seminar (3 credits):

- GLOA 720 - Capstone Research Seminar Credits: 3

Total: 30 credits

■ Higher Education

Phone: 703-993-2310
Web: highered.gmu.edu

Faculty


Course Work

This program offers all course work designated CTCH in the Courses chapter of this catalog.

Graduate Programs
The Higher Education Program prepares students for positions of leadership in teaching, research, and administration at community colleges, four-year colleges, and universities. The interdisciplinary curriculum emphasizes ethical leadership, assessment, and practice-based scholarship in teaching and learning. Students in these degrees come from varied professional backgrounds in college teaching, university administration, business, the performing arts, and government. They bring a vast spectrum of experience to their studies and fellow students.

**Doctor of Arts in Community College Education**

The doctor of arts in community college education prepares students for college teaching. They take course work in higher education pedagogy and in a disciplinary knowledge area. Working with an advisor, students choose appropriate courses from more than 20 participating departments. In addition to developing disciplinary expertise, the courses in higher education offers proficiency in core areas related to undergraduate education: the community college, college teaching, technology in higher education, and the scholarship of teaching and learning.

**MAIS Concentration in Community College Teaching**

The program sponsors the concentration in community college teaching within the master’s degree in interdisciplinary studies (MAIS). This concentration prepares students to teach entry-level courses in these growing fields in community colleges: communication, English, information systems, mathematics, Spanish, and teaching English as a second language.

See the Interdisciplinary Studies, MAIS section of this chapter.

**MAIS Concentration in Higher Education**

The program sponsors the concentration in higher education within the master’s degree in interdisciplinary studies (MAIS). This concentration prepares individuals for administrative and leadership positions in two-year colleges or four-year colleges and universities. Students may focus on administration or student services.

See the Interdisciplinary Studies, MAIS section of this chapter.

**Doctor of Philosophy in Education with Specialization in Higher Education**

The doctor of philosophy in education with a specialization in higher education is offered jointly by the Higher Education Program and the College of Education and Human Development. This doctoral program prepares students for positions of leadership in administration and student services through coursework in higher education administration and leadership and through a secondary concentration that can further disciplinary expertise.

See the College of Education and Human Development chapter of the catalog.

**Certificates**

The program offers graduate certificates in college teaching and in higher education administration. Students may take these as stand-alone certificates or pursue them concurrently with a graduate degree program. Part of the certificate course work may be able to be applied to the degree subject to the approval of the director of the graduate degree program. Students must apply and be accepted to a graduate certificate program.

**Master's Level Certificate**
College Teaching Graduate Certificate

Banner Code: LA-CERG-CTCH

Web: highered.gmu.edu

The certificate in college teaching is designed for graduate students who are planning a career in undergraduate education. The program offers courses that enhance pedagogical skills, explore pedagogical assessment or scholarship and the use of technology in instruction.

This program of study is offered by the Higher Education Program.

For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in college teaching may be pursued on a part-time or full-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in college teaching, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Three required courses (9 credits) chosen from:

Students may substitute courses with a disciplinary focus for any of the three required courses with prior written approval of the director.

- CTCH 602 - College Teaching Credits: 3
- CTCH 603 - Technology in Higher Education Credits: 3
  and
- CTCH 604 - The Scholarship of Teaching and Learning Credits: 3
  or
- CTCH 605 - Curriculum and Program Design and Assessment Credits: 3

Practicum (3 credits)

- CTCH 685 - Practicum Credits: 3

Two elective courses (6 credits)
Students should choose their electives in consultation with an advisor. They need to be approved by the director.

Total: 18 credits

Higher Education Administration Graduate Certificate

Banner Code: LA-CERG-HEDA

Web: highered.gmu.edu

The certificate in higher education administration is designed for individuals who are planning or enhancing a career in a broad range of administrative positions in higher education institutions. The certificate will provide core knowledge for administrative processes in the context of higher education institutions.

This program of study is offered by the Higher Education Program.

For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in higher education administration may be pursued on a part-time or full-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in higher education administration, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Three required courses (9 credits)

- CTCH 621 - Higher Education in the United States Credits: 3
- CTCH 622 - Organization and Administration in Higher Education Credits: 3
- CTCH 624 - Finance and Fiscal Management in Higher Education Credits: 3

One course (3 credits) chosen from:

Special topics courses, when relevant, may be used to fulfill this requirement with the prior written approval of the director.

- CTCH 603 - Technology in Higher Education Credits: 3
- CTCH 606 - Diversity in Higher Education Credits: 3
- CTCH 626 - Assessment in Higher Education Credits: 3
- CTCH 645 - The Contemporary College Student Credits: 3
Two elective courses (6 credits)

Electives should be chosen in consultation with an advisor.

Total: 18 credits

Doctoral Degree

Community College Education, DA

Banner Code: LA-DA-EDCC

Web: highered.gmu.edu

The doctor of arts in community college education (DACCE) prepares students to be leaders in undergraduate education. In addition to expertise in a selected disciplinary or interdisciplinary knowledge area, graduates are proficient in three core areas related to undergraduate education: college teaching and classroom assessment, organizational studies and administration, and higher education leadership. With this background and the guided practical experience provided by internships, students are prepared to lead their institutions to respond to the changing needs of 21st-century students.

This program of study is offered by the Higher Education Program.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. Applicants to the DA in community college education must already have earned a master's degree in a relevant field.

For information specific to the DA in community college education, see Application Requirements and Deadlines on the college web site.

Reduction of Credit

Students must have a master's degree before being admitted to the DA in community college education. Most students receive a reduction of credit of 30 credits based on their previous master's degree.

Program of Study

Working with an advisor, students develop a program of study that outlines courses that will be used to fulfill degree requirements. The program of study is approved by the advisor and director; any modifications require the student to file a Modification Form and a revised program of study.
Degree Requirements

Students must complete 90 credits to include a minimum of 60 credits beyond the master's degree.

Knowledge area (24 credits)

Substantial work in a knowledge area is essential to the leadership in curriculum expected of students. Given the dynamic nature of the community college and growth of programs in nontraditional fields, the choice of a knowledge area and relevant course work should be guided by the student’s developing interests and a vision of the student’s role as a community college educator. While many DACCE students take their 24 knowledge area credits exclusively in one discipline or department, they are encouraged to think broadly and in terms of multiple disciplines and work with their advisor to choose appropriate courses from more than one discipline or department.

Requirements include:

- Two courses (6 credits) in research design or methods. Students should choose these courses in consultation with an advisor.
- Six courses (18 credits) in the knowledge area. These are chosen by the student in consultation with an advisor. The courses appear on the Program of Study, which requires the approval of the advisor and director of the program.

Six courses (18 credits) in the education core

The 18-credit core of education courses is designed to develop leaders in undergraduate education. The program emphasizes a broad knowledge base in teaching and course work in the history and philosophy of the community college and instructional technology. These courses concentrate on scholarship and practice in teaching and learning, instructional technology, and program and curriculum design and assessment. All courses emphasize leadership, ethics, and diversity in higher education.

- CTCH 601 - The Community College Credits: 3
- CTCH 602 - College Teaching Credits: 3
- CTCH 603 - Technology in Higher Education Credits: 3
- CTCH 604 - The Scholarship of Teaching and Learning Credits: 3
- Two elective courses (6 credits). Electives are chosen in consultation with an advisor. The courses appear on the Program of Study, which requires the approval of the advisor and director of the program.

Two internships (6 credits)

Students complete two 3-credit internships to learn skills applicable to college-based teaching and higher education administration or policy. Internships provide an important educational experience that complements classroom-based course work. Prior to registering for CTCH 885, students should have completed 18 credits of education core requirements, 6 credits in the knowledge area, an approved "Request for Approval of Internship" form, and an approved program of study. Internships, which must be approved by the advisor and internship coordinator, require a minimum of 180 hours of work for 3 credits and participation in an internship seminar.

- CTCH 885 - Doctoral Internship in College Teaching and Administration Credits: 3

Electives (0-30 credits)

Students complete the remaining 90 credits through additional elective courses chosen in consultation with an advisor.
Dissertation (12 credits)

Students must complete a dissertation in which they demonstrate their ability to conduct original research that contributes new knowledge or a reinterpretation of existing knowledge to the area of investigation. Students who focus their dissertation in the knowledge area must connect their research to higher education. Dissertations may be practice-oriented, focusing on new and replicable ways of teaching within the knowledge area.

Once enrolled in 998, students in this degree program must maintain continuous registration in 998 or 999 each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Students complete a minimum of 3 credits of 998 and 3 credits of 999. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students enrolled in 999 are required to submit evidence of progress to the dissertation advisor and the program by the last day of classes each semester (as published in the Schedule of Classes), such as a draft of a chapter or a brief, descriptive report of research activities. Students showing successful progress will receive a grade of IP. Those who do not will receive an IN.

- CTCH 998 - Doctoral Dissertation Proposal Credits: 1-3 (minimum of 3 credits)
- CTCH 999 - Doctoral Dissertation Credits: 1-12 (minimum of 3 credits)

Total: 90 credits

Comprehensive Exams

Students must pass comprehensive exams to demonstrate breadth and depth of knowledge in both the knowledge area and education core. To be eligible to take a comprehensive exam, students must have completed all course work in the specific area, be in good standing (minimum cumulative GPA of 3.00), and be registered for at least 1 credit. The comprehensive exam for the education core is a portfolio reviewed by the Higher Education Program. The knowledge area exams are administered by the liaison in the knowledge area; each area has its own exam guidelines.

Students who do not pass a comprehensive exam in either area have until the last day of the next semester (published in the Schedule of Classes) to retake it. (For students who take exams in the summer months, this will be the published date for the fall semester.) Students who do not retake the exam by this deadline or do not successfully complete the comprehensive exam the second time will be terminated from the program.

Advancement to Candidacy

To advance to candidacy, students must complete all course work required on their approved program of study. Students must also successfully complete and pass comprehensive exams on the education core and the major knowledge area. In addition, students must have a dissertation committee appointed by the dean’s office. Evidence of the completed course work and comprehensive exams and an approved dissertation committee must be on file in the dean’s office before a student can be advanced to candidacy.

■ History and Art History

Phone: 703-993-1250
Web: historyarthistory.gmu.edu
Faculty

**Mathy professor:** Mattusch (art history)

**Robinson professors:** Crew, Bakhash (history); Hinton (art history)

**Professors:** J. R. Censer (dean), J. T. Censer, Holt, Kierner, Petrik, Sherwin, Smith, Stearns (provost), Wade, Zagarri (history)

**Associate professors:** Barnes, Bristol, Carton, Chang, Cohen, Copelman, Deshmukh, Hamdani, Hamner, Karush, Kelly, Landsberg, Lytton, O’Malley, Platt (chair), Ritterhouse, Schrag, Seully, Smith (history); Butler, DeCaroli (director), Greet, Todd (art history)

**Assistant professors:** Bottoms, Collins, Dodman, Gibbs, Lair, Takats (history); Ho (art history)

**Affiliate associate professors:** Jordan, Petrick, Schrum (history)

**Affiliate professor:** Nauright, Wiggins (history)

**Term faculty:** Leon, Manuel-Scott, McCord, Orens, Scheinfeldt, Schulze, Swanson, Walmsley (history); Bauman, DeArmendi, Gregg (art history)

Coursework

This department offers all course work designated HIST and ARTH in the Courses chapter of this catalog.

Undergraduate Programs

History

The department offers a BA in history. History majors study a variety of historical time periods, from Greek and Roman antiquity to the late twentieth-century. They learn to interpret and evaluate the past by analyzing a variety of sources, from historical books and novels to images, films, oral interviews, newspapers, and other texts.

History majors have the opportunity to study with faculty who are internationally known for their work on the use of technology in the study of history. They can do an internship with one of them in the Center for History and New Media or at places like the Smithsonian Institution, the Library of Congress, or at places like the many other institutions in the Washington, D.C. area. There are also many opportunities to study abroad while earning credit towards the history major.

Advising

Students majoring or minoring in history are advised by the undergraduate director and a team of faculty advisors. History majors are urged to discuss their program of study periodically with the director.

Honors in the Major

History majors who have completed 75 credits (a minimum of 15 in history, 6 of which must have been taken at Mason) with an overall GPA of 3.50 and a GPA of 3.50 in history courses are eligible to apply to graduate with honors in history. Applicants must have completed or be enrolled in HIST 300. The statement of application should include references from two Mason history faculty members. If a major part of the student’s work includes transfer credit, transcripts may be required. Not all applicants who meet the minimum requirements are guaranteed acceptance into honors in the major.
Students pursuing honors in the major complete HIST 490 and 491, linked individualized courses usually with the same instructor. Students must have completed at least one course in the field (or with the professor) chosen for these honors courses. HIST 490 should be taken before 491, although they may be taken concurrently. Either course may be taken concurrently with HIST 499 - Senior Seminar in History. To graduate with honors in the major, students must earn a minimum GPA of 3.50 in the honors courses and a minimum GPA of 3.50 in history courses applied to the degree. The two honors courses (6 credits) may be applied to the requirement of 36 credits in history, but they cannot replace HIST 499.

Minors

The department offers a minor in history available to students in any major at Mason.

The department faculty participate in a number of interdisciplinary minors including African and African American Studies Minor, Ancient Mediterranean Art and Archaeology Minor, Asia-Pacific Studies Minor, Islamic Studies Minor, Latin American Studies Minor and Middle East Studies Minor. Students can earn credit toward these minors by taking selected history and art history courses. For details, see the Minors and Interdisciplinary Minors section and the Latin American Studies section of this chapter.

The minor in sport and American culture is offered jointly by the Department of History and Art History and the School of Recreation, Health and Tourism. For details, see the School of Recreation, Health, and Tourism Department section in the College of Education and Human Development chapter of the catalog.

Bachelor’s/Accelerated Master’s Program

The department offers highly qualified undergraduate majors in history the opportunity to apply to an accelerated master’s degree program in history. If accepted, students will be able to earn both the undergraduate and graduate degrees after satisfactory completion of 144 credits, generally within five years.

Art History

The department offers a BA in art history. Art history majors investigate works of art to learn how they were made, why they were made, and by and for whom they were made. They develop the skills to interpret a work of art as a record of the culture in which it was made. Through art history courses, students will learn to ask questions that touch on cultural, technological, and economic concerns. The major has flexible requirements, and students in art history receive individualized attention which helps them tailor their studies to their own individual interests and career goals.

Art history majors have the opportunity to study with faculty whose expertise covers many world regions - the United States, Latin America, Europe, South and Southeast Asia, and China - and all historical periods - from classical antiquity, Byzantine, Medieval, Renaissance, and Baroque, to the modern era.

Students are encouraged to do an internship at one of the many arts organizations in the Washington, D.C. region, such as the National Gallery of Art or the Corcoran Gallery. There are also many opportunities to study abroad while earning credit towards the art history major.

Honors in the Major

Majors who have completed 75 credits (a minimum of 15 credits in art history, with 6 credits taken at Mason) with an overall GPA of 3.50 and a GPA of 3.80 in art history are eligible to apply to graduate with honors in art history. Eligible students should apply to the undergraduate director by November 15 or April 15 with a statement of application including the names of two references from Mason art history faculty members. Transfer students should also submit transcripts. Not all applicants who meet the minimum requirements are guaranteed acceptance into honors in the major.
Students pursuing honors in the major complete ARTH 492 and 493, linked individualized courses that culminate in a research paper. Students must have completed at least one course in the field (or with the professor) chosen for these honors courses. ARTH 492 should be taken before 493, but they may be taken concurrently. To graduate with honors in the major, students must earn a minimum GPA of 3.50 in honors courses and a minimum GPA of 3.50 in art history courses applied to the degree. The two honors courses (6 credits) may be applied toward the requirement of 33- to 34-credits in art history, but they cannot replace the 6 required credits in ARTH 400, 420, 430, 440, 460, 471, 472, or 482.

Minors

The department offers a minor in art history available to students in any major at Mason.

The Art History Program coordinates the Ancient Mediterranean Art and Archaeology Minor. See the Minors and Interdisciplinary Minors section of this chapter.

Graduate Programs

History

The department offers a master's and a doctoral degree in history. In both programs, students select a specialization in American history, European history, or world history. Master's degree students choose from one of four concentrations: predoctoral history, applied history, enrichment, or teaching. Doctoral students focus their studies in one of four areas: college/university teaching, new media and information technology, public and applied history, or preprofessional development.

Graduate students in history have the opportunity to take courses in new media, studying with faculty who are internationally known for their use of technology in the study of history. Many students work alongside the faculty in the Center for History and New Media, a leader in the use of digital media and computer technology to democratize history. The center uses digital media and technology to preserve and present history online, transform scholarship across the humanities, and advance historical education and understanding.

Students can do an internship in applied history at one of the many institutions in the Washington, D.C. area or study abroad while earning credit towards their degrees.

Funding

The department offers teaching and research assistantships, which are awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students awarded assistantships must register for a minimum of six credits a semester and show satisfactory progress toward their degree.

Art History

The department offers a richly interdisciplinary master's degree in art history. It draws on faculty strengths in traditional research and new media and the vast cultural resources of the Washington, D.C. area. Students learn methods of art historical analysis, a variety of art historical interpretations, and practical applications of the field. The program places a special emphasis on the development of skills in new media, museology, and pre-professional internships - program features that are unique to this region.

The master's degree in art history is designed to meet the needs of a student population with diverse interests and career goals. Because of the focus on skill building in traditional research as well as new media, graduates of this program have the tools necessary for independent research, professional work, and the dissemination of knowledge in art history.
Undergraduate Degree

Art History, BA

Banner Code: LA-BA-AH
Web: historyarthistory.gmu.edu

As a liberal arts discipline, art history emphasizes the analysis of visual data in a historical context. The bachelor's degree in art history prepares students for graduate study in art history as well as for professional work.

This program of study is offered by the Department of History and Art History.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in art history must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 33 to 34 credits with a minimum GPA of 2.00.

All art history majors are encouraged to pursue internships in art history (ARTH 393) in their junior or senior year. Up to 6 credits in art history internships may be applied toward ARTH requirements for the major, with permission of the art history undergraduate director.

Students are strongly encouraged to participate in a study abroad program. A maximum of 6 credits of ARTH 398 Study Abroad in the History of Art may be applied to the major with permission of department. Students contemplating graduate study in art history should acquire a reading knowledge of French, German, or other appropriate research languages in consultation with an advisor.

One or two survey courses (3-6 credits) chosen from:

- ARTH 200 - Survey of Western Art Credits: 3
- ARTH 201 - Survey of Western Art Credits: 3
- ARTH 203 - Survey of Asian Art Credits: 3
- ARTH 204 - Survey of Latin American Art Credits: 3

Five to six courses (15-18 credits) in ARTH at the 300 level

In addition to ARTH courses, art history majors may use one 300-level HIST course to fulfill this requirement.

One museum course (3 credits)

- ARTH 394 - The Museum Credits: 3
One course (3 credits) in ARTH at the 400 level chosen from:

- ARTH 400 - Historiography and Methods of Research in Art History Credits: 3
- ARTH 420 - Advanced Studies in Ancient Art Credits: 3
- ARTH 430 - Advanced Studies in Medieval or Islamic Art Credits: 3
- ARTH 440 - Advanced Studies in Renaissance and Baroque Art Credits: 3
- ARTH 460 - Advanced Studies in 20th-Century European Art Credits: 3
- ARTH 471 - Advanced Studies in Art of the United States Credits: 3
- ARTH 472 - Advanced Studies in 20th-Century Latin American Art Credits: 3
- ARTH 482 - Advanced Studies in Asian Art Credits: 3

One elective course (3 credits) in ARTH at the 400 level

One course (3 or 4 credits) in art and visual technology chosen from:

- AVT 103 - Introduction to the Artist's Studio Credits: 3
- AVT 104 - Studio Fundamentals I Credits: 4
- AVT 222 - Drawing I Credits: 4
- AVT 232 - Painting I Credits: 4
- AVT 243 - Printmaking I Credits: 4
- AVT 252 - Fundamentals of Photography Credits: 4
- AVT 253 - Introduction to Digital Photography Credits: 4
- AVT 262 - Sculpture I Credits: 4
- AVT 392 - Gallery Practices Credits: 4

Total: 33 to 34 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in art history fulfill the university’s writing-intensive requirement by successfully completing any 400-level ARTH course.

History, BA

Banner Code: LA-BA-HIST

Web: historyarthistory.gmu.edu
This program of study is offered by the Department of History and Art History.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in history must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 36 credits of history with at least 18 credits at the 300 and 400 levels. Additional credits of history in excess of 36 may be presented as elective credits to be counted toward graduation. Students must have a minimum GPA of 2.00 in courses applied to the major.

Before registering, students should see an advisor to help plan their history program to meet university general education and college-level requirements. The advisor also can help students choose electives or a minor.

HIST 300 and 499 may not be used to satisfy the first three requirements below.

Two courses (6 credits) of U.S. history chosen from:

- HIST 121 - Formation of the American Republic Credits: 3
- HIST 122 - Development of Modern America Credits: 3
- HIST 200 - Freshman/Sophomore Seminar in U.S. History Credits: 3
- HIST 331 - Postwar United States, 1945-1973 Credits: 3
- HIST 332 - United States since 1973 Credits: 3
- HIST 333 - The Automobile in the United States Credits: 3
- HIST 335 - The African American Experience in the United States: African Background to 1885 Credits: 3
- HIST 336 - The African American Experience in the United States: Reconstruction to the Present Credits: 3
- HIST 341 - History of Sport in the United States Credits: 3
- HIST 350 - U.S. Women's History Credits: 3
- HIST 351 - History of the Old South Credits: 3
- HIST 352 - The South since 1865 Credits: 3
- HIST 370 - War and American Society Credits: 3
- HIST 373 - The Civil War and Reconstruction Credits: 3
- HIST 377 - The Vietnam War Credits: 3
- HIST 389 - Topics in U.S. History Credits: 3
- HIST 391 - History of Virginia to 1800 Credits: 3
- HIST 392 - History of Virginia Since 1800 Credits: 3
- HIST 401 - Colonial America Credits: 3
- HIST 403 - Revolutionary Era in American History, 1763-1812 Credits: 3
- HIST 404 - Jacksonian America, 1812-1854 Credits: 3

Two courses (6 credits) of European history chosen from:

HIST 100 - History of Western Civilization used to fulfill the university-wide general education requirement in western civilization may also fulfill 3 credits of this requirement.
- HIST 101 - Foundations of Western Civilization Credits: 3
- HIST 102 - Development of Western Civilization Credits: 3
- HIST 201 - Freshman/Sophomore Seminar in European History Credits: 3
- HIST 301 - Classical Greece Credits: 3
- HIST 302 - Classical Rome Credits: 3
- HIST 304 - Western Europe in the Middle Ages Credits: 3
- HIST 305 - The Renaissance Credits: 3
- HIST 306 - The Reformation Credits: 3
- HIST 307 - Old Regime and Revolutionary Europe Credits: 3
- HIST 308 - Nineteenth-Century Europe Credits: 3
- HIST 309 - Europe in Crisis: 1914-1948 Credits: 3
- HIST 312 - Nationalism in Eastern Europe Credits: 3
- HIST 314 - History of Germany Credits: 3
- HIST 322 - Modern Britain Credits: 3
- HIST 328 - Rise of Russia Credits: 3
- HIST 329 - Modern Russia and the Soviet Union Credits: 3
- HIST 388 - Topics in European History Credits: 3
- HIST 426 - The Russian Revolution Credits: 3
- HIST 431 - Medieval Intellectual Topics Credits: 3
- HIST 435 - Society and Culture in Early Modern Europe Credits: 3
- HIST 436 - European Society and Culture: 19th and 20th Centuries Credits: 3
- HIST 480 - Alexander the Great Credits: 3

Two courses (6 credits) of global, Latin American, African, Asian, or Middle Eastern history chosen from:

Approved courses in history used to fulfill the university general education requirement in global understanding and the college-level requirement in non-Western culture may be used to fulfill this requirement.

- HIST 125 - Introduction to World History Credits: 3
- HIST 130 - History of the Modern Global System Credits: 3
- HIST 202 - Freshman/Sophomore Seminar in Global History Credits: 3
- HIST 251 - Survey of East Asian History Credits: 3
- HIST 252 - Survey of East Asian History Credits: 3
- HIST 261 - Survey of African History Credits: 3
- HIST 262 - Survey of African History Credits: 3
- HIST 271 - Survey of Latin American History Credits: 3
- HIST 272 - Survey of Latin American History Credits: 3
- HIST 281 - Survey of Middle Eastern Civilization Credits: 3
- HIST 282 - Survey of Middle Eastern Civilization Credits: 3
- HIST 353 - History of Traditional China Credits: 3
- HIST 354 - Modern China Credits: 3
- HIST 356 - Modern Japan Credits: 3
- HIST 357 - Postwar Japan Credits: 3
- HIST 358 - Post-1949 China Credits: 3
- HIST 360 - History of South Africa Credits: 3
- HIST 364 - Revolution and Radical Politics in Latin America Credits: 3
• HIST 365 - Conquest and Colonization in Latin America Credits: 3
• HIST 366 - Comparative Slavery Credits: 3
• HIST 367 - History, Fiction, and Film in Latin America Credits: 3
• HIST 387 - Topics in Global History Credits: 3
• HIST 460 - Modern Iran Credits: 3
• HIST 461 - Arab-Israeli Conflict Credits: 3
• HIST 462 - Women in Islamic Society Credits: 3
• HIST 465 - The Middle East in the 20th Century Credits: 3
• HIST 466 - Origins of Conflict in Southern Africa Credits: 3

One methods course (3 credits)

• HIST 300 - Introduction to Historical Method Credits: 3 (with a minimum grade of 2.00)

One seminar course (3 credits)

• HIST 499 - Senior Seminar in History Credits: 3 (fulfills university synthesis requirement)

Four elective courses (12 credits) in history

Students should choose courses in history at the 300 or 400 levels to meet this requirement if they need credits to complete the 18-credit, upper-level history requirement.

In addition to HIST courses, history majors may use one 300-level ARTH course to fulfill this requirement.

Total: 36 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in history may fulfill this requirement by successfully completing HIST 300 and 499.

Undergraduate Interdisciplinary Minor

Ancient Mediterranean Art and Archaeology Minor

Banner Code: ARTM
Faculty

Butler (coordinator), Cherubin, Lytton, Mattusch, Winkler

This interdisciplinary minor is for students with diverse interests in the material culture of the ancient world. Course work combines the study of archaeology, literature, art, history, philosophy, myth, and religion. The scope of the minor is not limited to Greece and Rome but touches on all the ancient civilizations of the Mediterranean and the heirs of late antiquity such as Byzantium and early Islam.

The program represents foundation work crucial to graduate study in traditional departments of classical, near Eastern, or Mediterranean art and archaeology. Through this minor, students are given credit for acquiring practical linguistic skills and archaeological field experience as well as scholarly background. Students should consult with the director for help in choosing a program of study that will complement their major.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Of the 18 credits required for the minor, least 3 credits must be taken in ARTH and at least 9 credits must be taken outside of ARTH.

One course (3 credits) of preparatory work

Students have three options for fulfilling this requirement.

A course in Classical Greek

- GREE 150 - Classical Greek I Credits: 3
- GREE 160 - Classical Greek II Credits: 3

A course in ancient literature

- ARTH 102 - Symbols and Stories in Art Credits: 3
- CLAS 250 - Classical Mythology Credits: 3
- CLAS 260 - The Legacy of Greece and Rome Credits: 3
- RELI 211 - Religions of the West Credits: 3

A course in Latin or a modern research language
This can be fulfilled with a course in any relevant language beyond the language requirement for the BA in the College of Humanities and Social Sciences. For information on how to complete this requirement, students should consult with the director of the minor.

Two to three elective courses (6 to 9 credits):

Other courses pertaining to the region and period, including ARTH 399, may be used to fulfill this requirement with the prior written approval of the director.

- ANTH 324 - Warfare, Violence, and Sacrifice in Antiquity Credits: 3
- ARTH 319 - Art and Archaeology of the Ancient Near East Credits: 3
- ARTH 320 - Art of the Islamic World Credits: 3
- ARTH 321 - Greek Art and Archaeology Credits: 3
- ARTH 322 - Roman Art and Archaeology Credits: 3
- ARTH 324 - From Alexander the Great to Cleopatra: The Hellenistic World Credits: 3
- ARTH 333 - Early Christian and Byzantine Art Credits: 3
- CLAS 340 - Greek and Roman Epic Credits: 3
- CLAS 350 - Greek and Roman Tragedy Credits: 3
- CLAS 360 - Greek and Roman Comedy Credits: 3
- CLAS 370 - Greek and Roman Historians Credits: 3
- CLAS 380 - Greek and Roman Novels Credits: 3
- CLAS 390 - Topics in Classical Literature and Culture Credits: 3
- HIST 301 - Classical Greece Credits: 3
- HIST 302 - Classical Rome Credits: 3
- HIST 480 - Alexander the Great Credits: 3
- PHIL 301 - History of Western Philosophy: Ancient Credits: 3
- RELI 352 - Judaism from Exile to Talmud Credits: 3
- RELI 381 - Beginnings of Christianity Credits: 3

3 credits of seminar:

- ARTH 420 - Advanced Studies in Ancient Art Credits: 3 (if topic pertains to region and period)
- ARTH 430 - Advanced Studies in Medieval or Islamic Art Credits: 3 (if topic pertains to region and period)

3 to 6 credits of a practicum:

ARTH 393 requires the prior written approval of the director. Students can also use archaeological field work done for credit to fulfill this requirement.

- ARTH 394 - The Museum Credits: 3
- ANTH 322 - Pirates, Conquest, and Death: Archaeology and Globalism since 1500 Credits: 3
- ARTH 393 - Art History Internships Credits: 3-6 (if content of internship pertains to region and period)
- ANTH 325 - Field Techniques in Archaeology Credits: 3-6
- ANTH 420 - Interpretation in Archaeology Credits: 3
- ANTH 430 - Research Methods in Archaeology Credits: 3
Asia-Pacific Studies Minor

Banner Code: APS

Web: Asia-Pacific Studies Minor

Phone: 703-993-2957

Faculty

Butler, Chang, Cuong, DeCaroli, Hinton, H. Nguyen (co-director), Lin, Paden, Platt (co-director), Ro, Wan, Zhang

The interdisciplinary minor in Asia-Pacific studies is for students whose interests focus on the humanities and social sciences and Asia’s role in global systems and the cultural mosaic of human experience.

Asia is the birthplace of many great religious and cultural traditions. It is a region in rapid and profound transformation. With half of the world’s population and half of its land mass, Asia is destined to play an increasingly important role in the global economy and world politics. A minor in Asia-Pacific studies will give you a better understanding of an important region of the world, broaden your perspective, and give you an edge in seeking jobs in various government agencies, international organizations, private businesses, law firms, and non-profit organizations that deal with Asia. It prepares you for graduate studies in the humanities or social sciences. This minor complements many majors including history, anthropology, communication, economics, and government and politics.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

9 of the 18 credits required for this minor must be at the 300 and 400 level. It is recommended that students interested in this minor take language courses in Chinese, Korean, or Japanese. 3 credits of one of these languages at the intermediate level (200-level) or above may be applied to the minor.

Two core courses (6 credits) chosen from:

- One course (3 credits) in a language relevant to the area such as Chinese, Korean, or Japanese at the 200-level (or higher)
- ARTH 203 - Survey of Asian Art Credits: 3
- GOVT 333 - Government and Politics of Asia Credits: 3
- HIST 251 - Survey of East Asian History Credits: 3
- HIST 252 - Survey of East Asian History Credits: 3
- RELI 212 - Religions of Asia Credits: 3
Four elective courses (12 credits):

Any course from the list of core course options not used to fulfill that requirement may be used as an elective course. Other electives are possible, including approved study abroad courses or internships, when relevant, with prior written approval of the director.

- ANTH 306 - Peoples and Cultures of Island Asia Credits: 3
- ANTH 311 - Peoples and Cultures of Mainland Southeast Asia Credits: 3
- ANTH 382 - Urban Anthropology Credits: 3
- ANTH 385 - Gender, Class, and Ethnicity in Latin America Credits: 3
- GOVT 433 - Political Economy of East Asia Credits: 3
- HIST 353 - History of Traditional China Credits: 3
- HIST 354 - Modern China Credits: 3
- HIST 356 - Modern Japan Credits: 3
- HIST 357 - Postwar Japan Credits: 3
- RELI 314 - Chinese Philosophies and Religious Traditions Credits: 3
- RELI 315 - Buddhism Credits: 3
- RELI 337 - Mysticism: East and West Credits: 3

Total: 18 credits

Islamic Studies Minor

Banner Code: ISLM

Phone: 703-993-5404

Web: islamicstudies.gmu.edu

Faculty

Amireh, Bakhash, Butler, Dakake (director), DeCaroli, Haddad, Hamdani, Katz, Lukacs, Mandaville, McGlinchey, Paden, Salawdeh

The minor in Islamic studies is designed for students interested in the societies, cultures, history, and politics of the Islamic world. It offers students the opportunity to study the many societies that have significant Muslim populations. These societies are not just in the Middle East. They stretch from North Africa to Southeast Asia and beyond. They include Europe as well as North America. To fulfill the requirements for the minor, students take a wide variety of courses from a range of departments. These courses provide students with a broad and well-rounded understanding of Islam.

The minor will enhance students' opportunities for future study and employment, especially in the Washington, D.C. area.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.
Course Work

Students pursuing this minor must complete 21 credits with a minimum GPA of 2.0.

Three core courses (9 credits)

- GOVT 345 - Political Islam Credits: 3
- HIST 281 - Survey of Middle Eastern Civilization Credits: 3
- RELI 272 - Islam Credits: 3

Three elective courses (9 credits) chosen from:

Special topics courses, when relevant, may be used to fulfill this requirement with prior written approval of the director.

- ANTH 308 - Peoples and Cultures of the Middle East Credits: 3
- ANTH 309 - Peoples and Cultures of India Credits: 3
- ANTH 311 - Peoples and Cultures of Mainland Southeast Asia Credits: 3
- ARTH 320 - Art of the Islamic World Credits: 3
- ARTH 382 - Arts of India Credits: 3
- ARTH 386 - The Silk Road Credits: 3
- FREN 453 - Topics in North African Francophone Literature and Culture Credits: 3
- GGS 325 - Geography of North Africa and the Middle East Credits: 3
- GGS 330 - Geography of the Soviet Succession States Credits: 3
- GOVT 328 - Non-Western Political Theory Credits: 3
- GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
- GOVT 340 - Central Asian Politics Credits: 3
- HIST 282 - Survey of Middle Eastern Civilization Credits: 3
- HIST 462 - Women in Islamic Society Credits: 3
- HIST 460 - Modern Iran Credits: 3
- HIST 465 - The Middle East in the 20th Century Credits: 3
- RELI 355 - Sufism Credits: 3
- RELI 374 - Islamic Thought Credits: 3
- RELI 375 - Qur'an and Hadith Credits: 3

One course (3 credits) in a foreign language of any country with a significant Muslim population

Arabic may be used to fulfill this requirement, but other languages of the Islamic world may be substituted with prior written approval of the director. This requirement may be waived for students who can demonstrate proficiency in a relevant foreign language. Contact the college Office of Undergraduate Affairs. Such students will have 3 additional elective credits.

Total: 21 credits
New Europe Minor

Banner Code: NEU

Phone: 703-993-4973

Web: neweurope.gmu.edu

Director

T. Mills Kelly, History and Art History

Europe is changing profoundly in a wide variety of ways. The New Europe interdisciplinary minor includes a range of courses and study abroad options that explore current developments in the Old Continent. It complements most undergraduate majors and will appeal to anyone with an interest in European history, politics, economics, society, and languages. Apart from its intellectual benefits, the New Europe minor should enhance students’ employment prospects in an increasingly interdependent global economy, especially one in which Europe is a major player.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 15 credits of coursework with a minimum GPA of 2.0.

One core course (3 credits)

GOVT 444 may be used to meet this requirement with prior written approval of the director.

- GOVT 334 - Government and Politics of Europe Credits: 3

Four elective courses (12 credits)

Students must take at least one course from each category below. When relevant to the minor, special topics courses, seminars, independent study, internships, and study abroad may also be taken to fulfill this requirement with prior written approval of the director.

History, geography, and politics

- ECON 380 - Economies in Transition Credits: 3
- GOVT 334 - Government and Politics of Europe Credits: 3 (if not taken as the core course)
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
• HIST 312 - Nationalism in Eastern Europe Credits: 3
• HIST 314 - History of Germany Credits: 3
• HIST 322 - Modern Britain Credits: 3
• HIST 329 - Modern Russia and the Soviet Union Credits: 3
• RUSS 354 - Contemporary Post-Soviet Life Credits: 3

Language, literature, and the arts

• ARTH 362 - Twentieth-Century European Art Credits: 3
• ENGH 361 - Continental Fiction, 1880-1950 Credits: 3
• ENGH 339 - British and Irish Drama after 1900 Credits: 3
• FREN 470 - French and Francophone Cinema Credits: 3
• GERM 451 - Modern Literature: 1925 to the Present Credits: 3
• PHIL 336 - Twentieth-Century Continental Thought: Existentialism Credits: 3
• PHIL 337 - Twentieth-Century Continental Thought: Phenomenology Credits: 3
• SPAN 484 - The Literature of Spain II Credits: 3

Total: 15 credits

Undergraduate Minor

Art History Minor

Banner Code: ARTH

Web: historyarthistory.gmu.edu

The minor in art history covers a broad spectrum of periods, cultures, and themes, with an emphasis on historical context.

This program of study is offered by the Department of History and Art History.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits with a minimum GPA of 2.00.

ARTH 394 is not required for the minor but is strongly encouraged.

Students are strongly encouraged to participate in a study abroad program. A maximum of 6 credits of ARTH 398 - Study Abroad in the History of Art may be applied to the minor with permission of department.
One to two courses (3 to 6 credits) in 100- or 200-level art history courses

Four to five courses (12 to 15 credits) in 300- or 400-level art history courses

Total: 18 credits

**History Minor**

**Banner Code:** HIST

Web: historyarthistory.gmu.edu

This program of study is offered by the Department of History and Art History.

For policies governing all minors, see the Academic Policies chapter of this catalog.

**Course Work**

Students pursuing this minor must complete 18 credits in history with a minimum GPA of 2.00.

Of the courses applied to the minor, four courses (12 credits) must be at the 300 or 400-level.

**Three courses (9 credits) in a region or topic**

Students choose courses to meet this requirement that are concentrated in a region or topic. The region or topic should related, if possible, to their major. They should review their plan with the director of the minor.

**Three elective courses (9 credits) in history**

Total: 18 credits

**Bachelor's/Accelerated Master's Program**

**History, BA/History, Accelerated MA**

Web: history.gmu.edu
Highly-qualified Mason undergraduates may apply to the accelerated master's degree program and obtain both bachelor's and master's degrees in history after satisfactory completion of 144 credits. The BA and MA earned separately require 120 and 30 credits respectively. Well-prepared undergraduates are encouraged to apply when they have completed between 75 and 90 credits. If accepted into the program, they must have completed 90 credits including HIST 300 with a minimum grade of B+ before they can enter the program. Interested students should contact the Director of Undergraduate Programs for details about the application process. This program of study is offered by the Department of History and Art History.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in history, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

Applicants accepted to the accelerated MA program must have completed 90 credits including HIST 300 with a minimum grade of B+ as a condition to entry into the program.

While undergraduate students, accelerated master's students complete the two graduate courses (6 credits) indicated on their Accelerated Master's Program Application with a minimum grade of 3.00 in each course. These credits cannot replace HIST 499. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor's/Accelerated Master's Transition Form and are admitted to graduate status.

As graduate students, accelerated master's students have an advanced standing. They must meet all master's degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master's program the semester immediately following conferral of the undergraduate degree.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition Form.

**Master's Degree**

**Art History, MA**

*Banner Code: LA-MA-AH*
The program in art history offers a unique master’s degree based on departmental strengths in traditional research, the application of new media, and the vast cultural resources of the Washington, D.C., area. Students study a broad range of art-historical periods, theory, and research methods. In addition, the program emphasizes new media skills, museum studies, and preprofessional internship training. Graduates are well-prepared for art museum and gallery professional work, where a master's degree is now routinely required, or further study in doctoral programs.

This program of study is offered by the Department of History and Art History.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in art history, see Application Requirements and Deadlines on the departmental website.

Degree Requirements

Three required courses (9 credits)

- ARTH 600 - Methods and Research in Art History Credits: 3
- ARTH 601 - Colloquium in Art History Credits: 3
- ARTH 699 - Topics in Art History Credits: 3

Four to five elective courses (12-15 credits) in ARTH and HIST

Students may choose electives in AVT, ANTH, or CULT with prior written permission of the graduate director. Students who choose to write a thesis complete 12 elective credits; others complete 15.

One course (3 credits) of applied preprofessional learning chosen from:

- ARTH 593 - Internship in Art History and the Decorative Arts Credits: 3-6
- ARTH 594 - The Museum Credits: 3

One course (3 credits) in technology and new media

Students choose one of the following courses to prepare for the comprehensive exam:

- HIST 696 - Clio Wired: An Introduction to History and New Media Credits: 3
- HIST 697 - Creating History in New Media Credits: 3
Research language proficiency

Students must demonstrate reading ability in one relevant research language to be approved by the graduate director.

Written comprehensive exam

Students who do not pass may retake the exam once, following the original process. The second exam must be taken within 12 months of the first exam.

Thesis (3 credits) (optional)

Students who choose to write a thesis should be aware of the policies governing theses as stated in the Academic Policies chapter of this catalog. They must follow the thesis enrollment policy of the university and once enrolled in ARTH 799, maintain continuous enrollment.

- ARTH 799 - Master’s Thesis Credits: 1-3

Total: 30 credits

History of Decorative Arts, MA

Banner Code:  LA-MA-HDA

Web: hda.gmu.edu

The MA in the history of decorative arts is offered in partnership with The Smithsonian Associates. It presents students with the challenge of integrating the history of the decorative arts into the study of art history and cultural studies as a whole. Students take courses in decorative arts, design history and theory, material culture, and museology.

The program prepares students for employment at museums, historic organizations, and in the commercial art and design marketplace. It is also excellent preparation for a number of doctoral programs.

This program of study is offered by the Department of History and Art History.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of the catalog. For information specific to the MA in the history of decorative arts, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements
To receive the MA in the history of decorative arts students must complete 48 graduate credits with a minimum GPA of 3.0. A maximum of 9 credits from other institutions may be transferred into this program subject to the approval of the director and the dean.

**Eight core courses (24 credits)**

- ARTH 570 - Proseminar in History of Decorative Arts Credits: 3
- ARTH 571 - Survey of Decorative Arts I Credits: 3
- ARTH 572 - Survey of Decorative Arts II Credits: 3
- ARTH 630 - Material Culture Studies Credits: 3
- ARTH 640 - European Decorative Arts Credits: 3
- ARTH 650 - Global Decorative Arts Credits: 3
- ARTH 660 - Museum Studies Credits: 3
- ARTH 670 - Design and Design History Credits: 3

**Six to eight elective courses (18-24 credits)**

Students choose electives in consultation with an advisor. Courses with variable topics may be repeated for credit when the topic varies. A total of 6 credits of independent study and 6 credits of internship each may be applied to the degree.

Students may apply 3 or 6 credits of thesis in place of 1 or 2 elective courses. Students who do not complete a thesis complete 24 elective credits and a comprehensive examination.

- ARTH 593 - Internship in Art History and the Decorative Arts Credits: 3-6
- ARTH 594 - The Museum Credits: 3
- ARTH 596 - Independent Study Credits: 1-3
- ARTH 599 - Special Topics in Art History and the Decorative Arts Credits: 1-6
- ARTH 610 - Theory of Decorative Arts Credits: 3
- ARTH 620 - Topics in Individual Decorative Arts Credits: 3

**Examination or thesis**

Students must successfully pass a comprehensive examination or complete a 4-6 credit thesis.

**Examination**

The purpose of the comprehensive examination is to test the student’s familiarity with the important objects and literature relating to one major and one minor field. Fields are defined by country, medium, and century (18th; 19th; 20th century). The student is expected to be conversant with bibliographic references, be able to evaluate information critically, and be able to recognize objects, makers, and styles. The exam consists of a one-hour oral component on the major and minor fields followed by an essay on the major field.

**Thesis (4 - 6 credits)**
A thesis requires a minimum of 2 semesters. Students who do a 4-credit thesis register for 3 credits the first semester and 1 the second semester; they take 3 fewer elective credits. Their degree total will be 49 credits. Students who do a 6-credit thesis register for 3 credits the first semester and 3 credits the second semester; they take 6 fewer elective credits. Their total is 48 credits.

Once enrolled in ARTH 799, students are required to maintain continuous registration until the thesis is submitted to and accepted by the University Library. The continuous registration policy is specified in the Academic Policies chapter of the catalog.

- ARTH 799 - Master’s Thesis Credits: 1-3

Total: 48-49 credits

History, MA

Banner Code: LA-MA-HIST

Web: historyarthistory.gmu.edu

The Department of History and Art History provides graduate training in historical methods and analysis for students with widely varying goals. The MA concentrations that follow are designed to meet those goals.

This program of study is offered by the Department of History and Art History.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in history, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

Students pursuing this degree must complete the requirements for one of the concentrations below. The first five concentrations require 30 credits of course work along with a specialization in U.S. history (AH), modern European history (EH), or world history (WH). The concentration in teaching requires 36 credits.

Students may be required to take up to 12 additional credits of foundation courses, which cover broad thematic areas (HIST 601, 602, 605, 606), to remedy gaps in their undergraduate preparation. If required as foundational, these credits cannot be applied toward the credits required for the degree.

If foundation courses are not required at admission, students in the concentrations in enrichment and teaching may apply up to one thematic course (3 credits) toward their degree. Students in the other concentrations may not apply these courses toward their degree.

Students may apply no more than 6 credits earned through study abroad courses toward their degree.
▲ Concentration in Predoctoral History (AH1, EH1, WH1)

This concentration is for students planning to pursue doctoral studies. Students choose one of three specializations and take most of their coursework, a seminar, and a readings course in that specialization.

One required course (3 credits) taken within the first 9 credits:

- HIST 610 - The Study and Writing of History Credits: 3

Three to four courses (9-12 credits) in a specialization:

Students who complete the 3-credit HIST 798 have 12 credits of electives in their specialization, while students who complete a 6-credit thesis (HIST 799) have 9.

- **Specialization in U.S. history** (at least 3 credits from each group):
  - Origins to 1861
  - 1861–1914
  - 1914 World War I to the present
- **Specialization in European history** (at least 3 credits from each group):
  - Ancient, medieval, early modern to 1789
  - 1789–1914
  - 1914 to the present
- **Specialization in world history** (at least 3 credits from two regions):
  - Africa
  - Asia
  - Middle East
  - Latin America

One research seminar (3 credits) in a specialization:

- HIST 711 - Research Seminar in U.S. History Credits: 3
- HIST 731 - Research Seminar in European History Credits: 3
- HIST 751 - Research Seminar in Comparative World History Credits: 3

One comprehensive reading course (3 credits) in a specialization:

The comprehensive reading course is designed by the student and a professor and taken during the last semester of coursework. It generally requires reading beyond what is required in the other concentrations. This course is used to round out general historical knowledge and prepare students for the comprehensive exam.

- HIST 790 - Comprehensive Readings in U.S. History Credits: 3
- HIST 791 - Comprehensive Readings in Comparative World History Credits: 3
- HIST 792 - Comprehensive Readings in European History Since 1500 Credits: 3
Two elective courses (6 credits) in history

Written comprehensive exam

Students who do not pass the comprehensive exam are given the option of taking a second exam following the original procedures. The second exam must be taken within a calendar year.

Reading proficiency in a modern foreign language, as demonstrated by course work or an exam

3 credits of project or 6 credits of thesis

- HIST 798 - Directed Research and Writing in History Credits: 3
- HIST 799 - Thesis Credits: 1-6

Note:
HIST 798 requires the completion of a major paper that is a substantial and original contribution to historical knowledge on the model of an article in a scholarly journal. If students choose to take HIST 798, they complete an additional 3 credits in their specialization.

Total: 30 credits

▲ Concentration in Predoctoral History with an Emphasis in Cultural History (AH5, EH5, WH5)

This concentration is for students with a particular interest in cultural history and students considering future work in the cultural studies doctoral program. Completion of this program of study does not guarantee admission to the doctoral program in cultural studies. Students interested in that degree program should contact the Cultural Studies Program.

One required course (3 credits) taken within the first 9 credits:

- HIST 610 - The Study and Writing of History Credits: 3

Three courses (9 credits) in a specialization:

- Specialization in U.S. history (at least 3 credits from each group):
  - Origins to 1861
- 1861–1914
- 1914 World War I to the present

- **Specialization in European history** (at least 3 credits from each group):
  - Ancient, medieval, early modern to 1789
  - 1789–1914
  - 1914 to the present

- **Specialization in world history** (at least 3 credits from two regions):
  - Africa
  - Asia
  - Middle East
  - Latin America

One research seminar (3 credits) in a specialization:

- HIST 711 - Research Seminar in U.S. History Credits: 3
- HIST 731 - Research Seminar in European History Credits: 3
- HIST 751 - Research Seminar in Comparative World History Credits: 3

One comprehensive reading course (3 credits) in a specialization:

The comprehensive reading course is designed by the student and a professor and taken during the last semester of course work. It generally requires reading beyond what is required in the other concentrations. This course is used to round out general historical knowledge and prepare students for the comprehensive exam.

- HIST 790 - Comprehensive Readings in U.S. History Credits: 3
- HIST 791 - Comprehensive Readings in Comparative World History Credits: 3
- HIST 792 - Comprehensive Readings in European History Since 1500 Credits: 3

One required course (3 credits) in cultural studies:

- CULT 802 - Histories of Cultural Studies Credits: 3

One course (3 credits) in approaches to cultural history

Students should consult with the director on an appropriate course to fulfill this requirement.

One course (3 credits) from outside the area of specialization containing a significant cultural history component as defined by the instructor

Written comprehensive exam
Students who do not pass the comprehensive exam are given the option of taking a second exam following the original procedures. The second exam must be taken within a calendar year.

Reading proficiency in a modern foreign language, as demonstrated by course work or an exam

3 credits of project

- HIST 798 - Directed Research and Writing in History Credits: 3

Note:

HIST 798 requires the completion of a major paper on a topic in cultural history that is a substantial and original contribution to historical knowledge on the model of an article in a scholarly journal.

Total: 30 credits

▲ Concentration in Applied History (AH2, EH2, WH2)

This concentration is for students seeking expertise in applied history fields, such as archival management, museum studies, historic preservation, and historical editing. It is also suitable for professionally employed historians who desire to further their careers.

One required course (3 credits) taken within the first 9 credits:

- HIST 610 - The Study and Writing of History Credits: 3

Four courses (12 credits) in a specialization:

- **Specialization in U.S. history** (at least 3 credits from each group):
  - Origins to 1861
  - 1861–1914
  - 1914 World War I to the present

- **Specialization in European history** (at least 3 credits from each group):
  - Ancient, medieval, early modern to 1789
  - 1789–1914
  - 1914 to the present

- **Specialization in world history** (at least 3 credits from two regions):
  - Africa
  - Asia
  - Middle East
Latin America

One research seminar (3 credits) in a specialization:

- HIST 711 - Research Seminar in U.S. History Credits: 3
- HIST 731 - Research Seminar in European History Credits: 3
- HIST 751 - Research Seminar in Comparative World History Credits: 3

Two to three courses (6-9 credits) in applied history

Students choose from courses from HIST 689 - 697. These include courses in historic preservation, museum studies, archives, historical editing, or new media and information technology.

3 or 6 credits of internship

If students chose to do a 3-credit internship, they will take an additional 3 credits in applied history course work.

- HIST 794 - Internship in Applied History Credits: 3-6

Proficiency in a relevant research tool

- Demonstrated by course work or exam in computers, statistics, or a modern foreign language

Total: 30 credits

▲ Concentration in Applied History with New Media and Information Technology Emphasis (AH4, EH4, WH4)

One required course (3 credits) taken within the first 9 credits:

- HIST 610 - The Study and Writing of History Credits: 3

Four courses (12 credits) in a specialization:

- **Specialization in U.S. history** (at least 3 credits from each group):
  - Origins to 1861
  - 1861–1914
  - 1914 World War I to the present
- **Specialization in European history** (at least 3 credits from each group):
Ancient, medieval, early modern to 1789
1789–1914
1914 to the present

- **Specialization in world history** (at least 3 credits from two regions):
  - Africa
  - Asia
  - Middle East
  - Latin America

One research seminar (3 credits) in a specialization:

- HIST 711 - Research Seminar in U.S. History Credits: 3
- HIST 731 - Research Seminar in European History Credits: 3
- HIST 751 - Research Seminar in Comparative World History Credits: 3

Two courses (6 credits) in new media and information technology

Students should consult the department for relevant courses.

3 or 6 credits of internship in information technology

If students chose to do a 3-credit internship, they will take an additional 3 credits in applied history course work.

- HIST 794 - Internship in Applied History Credits: 3-6

Proficiency in a relevant research tool

- Demonstrated by course work or exam in computer science, statistics, information technology, or a modern foreign language

Total: 30 credits

▲ **Concentration in Enrichment (AH3, EH3, WH3)**

This concentration is for students who want to study history for intellectual self-fulfillment or vocational reasons. It allows more flexibility in the selection of courses and does not have a foreign language requirement.

One required course (3 credits) taken within the first 9 credits:

- HIST 610 - The Study and Writing of History Credits: 3
Four courses (12 credits) in a specialization:

- **Specialization in U.S. history** (at least 3 credits from each group):
  - Origins to 1861
  - 1861–1914
  - 1914 World War I to the present

- **Specialization in European history** (at least 3 credits from each group):
  - Ancient, medieval, early modern to 1789
  - 1789–1914
  - 1914 to the present

- **Specialization in world history** (at least 3 credits from two regions):
  - Africa
  - Asia
  - Middle East
  - Latin America

One research seminar (3 credits) in a specialization:

- HIST 711 - Research Seminar in U.S. History Credits: 3
- HIST 731 - Research Seminar in European History Credits: 3
- HIST 751 - Research Seminar in Comparative World History Credits: 3

Four elective courses (12 credits)

Thesis Option

Students may optionally write a thesis. Students who choose this option complete only 6 credits of electives.

- HIST 799 - Thesis Credits: 1-6

Total: 30 credits

▲ **Concentration in Teaching (HS4)**

This concentration is intended for students already licensed for teaching or seeking licensure. Although it includes course work in history and education, completion of this concentration alone is not sufficient to qualify for licensure. A licensure program is offered by the College of Education and Human Development (CEHD), and admission is limited. Students are advised to consult with CEHD for specific requirements regarding licensure.

One required course (3 credits) taken within the first 9 credits:
Six courses (18 credits) in history

- Choose at least one course (3 credits) each from U.S., European, and world history

One research seminar (3 credits) chosen from:

- HIST 711 - Research Seminar in U.S. History Credits: 3
- HIST 731 - Research Seminar in European History Credits: 3
- HIST 751 - Research Seminar in Comparative World History Credits: 3

Four courses (12 credits) in graduate education courses, including:

- EDCI 567 - Teaching Social Studies in the Secondary School Credits: 3
- EDUC 522 - Foundations of Secondary Education Credits: 3
- EDCI 667 - Advanced Methods of Teaching Social Sciences in the Secondary School Credits: 3
- EDRD 619 - Literacy in Content Areas Credits: 3
- EDUC 672 - Human Development and Learning: Secondary Education Credits: 3

Total: 36 credits

Doctoral Degree

History, PhD

Banner Code: LA-PHD-HIST

Web: historyarthistory.gmu.edu

The PhD in history prepares students for careers in college teaching, digital media, publishing, educational administration, public history, and historical research. Students gain expertise in conventional historical methods and web-based technologies. Major fields include U.S. history, European history, and world history; minor fields are chosen by the student and may include such areas as public history, constitutional studies, and new media and information technology.

Depending on career goals and interests, students can also focus their degrees in one of four areas:

**College and university teaching:** This emphasis is for students who are seeking a career in teaching or research at the community college, college, or university level.

**New media and information technology:** Although all students in the program take some courses in new media, students in this emphasis seek careers specifically in new media (publishing, education, or a college or university history department where they
would serve as the department’s lead person in new media and information technology). This emphasis requires more advanced work in new media than any other.

**Public and applied history:** This emphasis prepares students for work in applied areas of history, such as museums, archives, federal government work, preservation, and editing, or helps students already working in those areas to advance. In some cases, students will do advanced course work in their field of work; in other cases, they will acquire knowledge or skills that will foster their professional work (such as nonprofit management).

**Professional development:** This emphasis responds to the needs of students who have already launched a career and want a doctoral degree to further career goals or fulfill personal intellectual goals. Candidates who need flexible scheduling will be advised on a case-by-case basis.

This program of study is offered by the Department of History and Art History.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the PhD in history, see Application Requirements and Deadlines on the departmental web site.

**Reduction of Credit**

For students entering the doctoral program with a master’s degree, the number of required credits may be reduced by a maximum of 30 credits, subject to approval of the program faculty and the dean. Requests for reduction of credit are reviewed only after acceptance to the doctoral program.

**Degree Requirements**

Students pursuing this degree must complete a minimum of 72 graduate credits. Students will be terminated from the program if they receive more than one unsatisfactory grade (C or F). No more than 6 credits earned through study abroad courses may be applied towards the degree.

In addition to core courses, students must complete course work in a major field of study and two minor fields; pass a comprehensive exam; and complete a dissertation. The dissertation demonstrates mastery of the subject matter, methodologies, and conceptual foundations in the chosen field of study. This requirement is generally achieved through consideration of a problem on the boundaries of knowledge in the discipline.

**Six core courses (16-21 credits):**

- HIST 610 - The Study and Writing of History Credits: 3
- HIST 696 - Clio Wired: An Introduction to History and New Media Credits: 3
- HIST 697 - Creating History in New Media Credits: 3
- HIST 810 - History Doctoral Colloquium Credits: 1 (Students take 1 credit a semester until they advance to candidacy or reach a total of 6 credits.)
- HIST 811 - Doctoral Research Seminar Credits: 3
and one seminar course chosen from:

- HIST 711 - Research Seminar in U.S. History Credits: 3
- HIST 731 - Research Seminar in European History Credits: 3
- HIST 751 - Research Seminar in Comparative World History Credits: 3

Major field (15 credits)

Students take courses in one of three possible fields: U.S. history, European history, comparative world history.

Minor fields (18 credits)

Students choose two minor fields and take 9 credits in each. Minor fields may include areas such as public history, constitutional studies, and new media and information technology.

Doctoral research skills

Students must demonstrate basic competency in computers. Students whose research requires knowledge of a foreign language must also demonstrate a reading knowledge of one foreign language. The department sets specific research skills requirements for students, depending on their field of study.

Comprehensive exam

Students need to pass a comprehensive exam that consists of a written field exam for each minor field and an oral exam for the major field.

Dissertation (minimum of 18 credits)

Once enrolled in 998, students in this degree program must maintain continuous registration in 998 or 999 each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students who complete less than 6 credits of HIST 810 must take additional credits of HIST 998 or 999 to reach the 72 credits required for the program.

Students may apply to this degree a minimum of 3 and a maximum of 6 credits of 998 and a minimum of 15 credits of 999.

- HIST 998 - Doctoral Dissertation Proposal Credits: 1-6
- HIST 999 - Doctoral Dissertation Research Credits: 1-12 (minimum of 15 credits)

Total: 72 credits
Advancement to Candidacy

To advance to candidacy, students must complete all course work required on their approved program of study. Students must also successfully complete and pass an oral comprehensive exam in a major field and written examinations in two minor fields. In addition, students must have a dissertation committee appointed by the Dean’s Office as well as an approved proposal. Evidence of the approved proposal must be on file in the Dean’s Office before a student can be advanced to candidacy.

Honors Program in General Education

Phone: 703-993-1110
Web: honors.gmu.edu

Faculty

Honors students have the opportunity to study with some of Mason’s most accomplished teachers and scholars from disciplines across the university, including Mason’s Robinson Professors.

Course Work

The program offers all course work designated HNRS and HNRT in the Courses chapter of this catalog.

Honors Program

The Honors Program is the academic program of the Mason's Honors College (described in the University Academic Programs and Resources section of this catalog), which provides talented students in all majors with an enriched academic and social environment that enhances their college experience.

The Honors Program offers a unique selection of integrated courses designed for highly motivated students and taught by many of Mason’s most experienced teachers and accomplished scholars. Taken together, these courses satisfy the general education requirements in social sciences and humanities for all colleges and majors in the university. Because most honors classes have fewer than 25 students, honors students have the opportunity to be known and mentored by distinguished faculty during their first years on campus.

The Honors Program also offers students special access to the technical, intellectual, and artistic resources of the university and the national capital region. It seeks to develop among its students a sense of intellectual community and a commitment to lifelong learning.

Admission

Admission is limited and competitive. Applicants are evaluated on the strength of their entire academic record, including the rigor of the high school curriculum, GPA, and standardized test scores. Students are allowed to use AP, IB, and dual-enrollment credit taken before admission to Mason to substitute for many HNRS and HNRT courses, excluding HNRS 110 and HRNS 353.

Honors Curriculum

The core of the honors curriculum is designed to satisfy the university general education requirements through a small number of interdisciplinary courses, allowing students increased opportunities to pursue minors or other individual interests.
To receive honors in general education on their transcript, students must earn a minimum GPA of 3.00 in HNRS and HNRT courses as well as supporting courses required for their approved honors program. Students whose cumulative GPA falls below 3.00 may complete the program but will not receive honors recognition on their transcripts.

**Two required courses (7 credits):**

HNRS 110 - Research Methods  Credits: 4
HNRS 353 - Technology in the Contemporary World Credits: 3

**Three honors core courses chosen from (9 credits):**

HNRS 122 - Reading the Arts  Credits: 3  (Art History/Arts)
HNRS 131 - Contemporary Society in Multiple Perspectives  Credits: 3  (Social Science with a Global Perspective)
HNRS 240 - Reading the Past  Credits: 3  (History)

HNRS 130 - Conceptions of Self  Credits: 3 (Philosophy/Religion)
HNRS 230 - Cross-Cultural Perspectives  Credits: 3 (Social Science with a Non-Western Perspective)

Honors students must satisfy general education requirements met by HNRS 122, 131 and 240. If a student chooses not to take these three courses, the requirements in parentheses must be satisfied by university approved general education courses. HNRS 130 and HNRS 230 meet college level requirements for the B.A. in the College of Humanities and Social Sciences.

Students who complete the requirements described above also fulfill university general education requirements for information technology, oral communication and literature.

**Choose two courses from the list above or from the following list of approved departmental honors courses (6-10 credits):**

ACCT 204 - Honors Survey of Accounting Credits: 3
BIOL 213 - Cell Structure and Function Credits: 4 (Honors section only)
BIOL 308 - Foundations of Ecology and Evolution Credits: 5 (Honors section only)
BIOL 310 - Biodiversity Credits: 5 (Honors section only)
CHEM 211 - General Chemistry Credits: 4 (Honors section only)
CHEM 212 - General Chemistry Credits: 4 (Honors Section only)
CS 211 - Object-Oriented Programming Credits: 3 (Honors Section only)
ECON 103 - Contemporary Microeconomic Principles Credits: 3 (Honors section only)
MATH 116 - Analytic Geometry and Calculus II (Honors)  Credits: 4
MATH 215 - Analytic Geometry and Calculus III (Honors) Credits: 3
MATH 216 - Theory of Differential Equations Credits: 3
OM 211 - Honors Statistical Analysis for Management Credits: 4

PHYS 160 - University Physics I Credits: 3 (Honors section only)

PHYS 260 - University Physics II Credits: 3 (Honors section only)

RHBS 490 - Clinical Research Internship Credits: 3

Note: Many of these courses have prerequisites or other departmental requirements. The Honors College may add additional approved courses to meet the requirements of this section. See the Honors College for a complete list.

Additional Requirements:

- Each honors student must take one approved math course, the course depending on major. Approved math courses are MATH 113, HNRT 125 and HNRT 225. Additional math courses are required for some majors.

- Each honors student must take two courses in an approved lab science sequence, the courses depending on the major. Additional science courses are required for some majors. Approved lab sciences sequences include:
  - BIOL 213 and higher level biology lab course
  - CHEM 211 and CHEM 212
  - PHYS 243/244 and PHYS 245/246
  - PHYS 160/161 and 260/261
  - BIOL 124, BIOL 125 and BIOL 246/306
  - HNRT 227 and HNRT 228
  - ASTR 111/112 and HNRT 228
  - BIOL 103 and HNRT 228
  - CHEM 103 and HNRT 228
  - EVPP 110 and HNRT 228
  - GEOL 101 and HNRT 228
  - PHYS 103 and HNRT 228
  - BIOL 124, BIOL 125, and HNRT 228
  - other lab science sequence with written approval of Honors College advisor

- Students pursuing B.A. degrees may have a foreign language requirement

- Beyond the Honors College requirements students must satisfy all requirements of their college and major

Continuation in Honors

Students in the program who are placed on academic warning because their GPA falls below 2.00 (1.80 in the first or second semester) may be ineligible to continue in the program.

Honors students are expected to maintain high standards of academic integrity and personal conduct. Students may be asked to withdraw from the program for a violation of the University Honor Code or any other conduct that reflects adversely on the Honors Program.

Students who leave the program before completion must meet university general education requirements and college-level requirements for their particular degree programs. On leaving the program and before registering for general education courses, students should be advised in their major program on equivalencies between the honors courses they have completed and general education requirements.

Transfer of Honors Credits
Within George Mason: Because of the sequential and integrated nature of the program, honors courses may not correspond exactly to other courses used to fulfill general education requirements. A list of equivalencies is available in the Honors Program Office and on the web site.

Outside George Mason: Course work in the Honors Program may meet the general education requirements of other universities. As in all transfer situations, general education requirements of one institution may not precisely match those of another.

**Individualized Study**

Phone: 703-993-4556  
Web: bis.gmu.edu

**Administration**

Jeannie Brown Leonard (Director)

**Course Work**

The program offers all course work designated BIS in the Courses chapter of this catalog.

**Undergraduate Program**

The bachelor of individualized study (BIS) provides an alternative to the traditional baccalaureate degree. It offers students a distinctive educational opportunity that allows them to integrate previous experiences into university course work. Recognizing that college-level learning may be acquired through varied professional, military, and personal experience, the Individualized Study Program provides mechanisms for translating experiential learning into academic credit. It accepts transfer credits from traditional institutions of higher education, as well as credits earned through other appropriate means.

In this degree program, most students design their own individualized interdisciplinary program of study. Other students who are interested in early childhood education and who meet specific eligibility requirements can pursue a more prescribed curriculum that leads to a concentration in early childhood education studies.

**Eligibility**

Applicants for an individualized study degree must have completed high school at least seven years prior to admission to the program and have accumulated at least 30 college-level credits, 15 of which must have been earned through conventional classroom instruction. They should have a minimum GPA of 2.50 in their previous course work. The concentration in early childhood education studies is an exception to the seven-year time limit.

**Application and Admission**

Students who are interested in the bachelor of individualized study degree must attend an information session. In addition to applying to Mason through the Office of Admissions, they need to apply separately to the BIS Program. The schedule of BIS information sessions and the BIS application are available on the BIS Program web site.

**Honors in the Major**
Highly qualified students may apply to graduate with honors in the major. Students should apply the semester before they intend to enroll in BIS 390 - The Research Process. If accepted, students must complete BIS 391 - The Research Process for Honors in place of BIS 390 and an individualized section of BIS 490. To graduate with honors in the major, students must complete these two courses with a minimum GPA of 3.50, maintain a minimum cumulative GPA of 3.75, and successfully present their research during the Senior Capstone Project presentations (by earning a grade of 2.0 or better in BIS 491).

Credit for Nontraditional Modes of Learning

The BIS program allows students to receive college credit for learning acquired through a variety of nontraditional methods. For details, see the Individualized Study (BIS) section of the catalog below.

Bachelor’s/Accelerated Master’s Program

The program offers highly qualified undergraduates the opportunity to apply to accelerated master’s degree programs in telecommunications or in applied information technology. If accepted, students will be able to earn both an undergraduate and a graduate degree after satisfactory completion of 144 credits.

Undergraduate Degree

Individualized Study, BIS

Banner Code: LA-BIS-INDV

Web: bis.gmu.edu

Students pursuing a bachelor of individualized study must meet the baccalaureate degree requirements for all undergraduates: they need to complete 120 credits with 45 credits at or above the 300 level and at least 30 credits at Mason.

This program of study is offered by the Individualized Study Program.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Credit for Nontraditional Modes of Learning

The BIS program allows students to receive college credit for learning acquired through a variety of nontraditional methods indicated below. The maximum allowable credits are indicated for each category.

1. Nationally recognized exam programs such as the College Level Examination Program (CLEP) when the particular exam has been approved for Mason credit: See CLEP Examination for an approved list. A maximum of 45 maximum credits can be earned through exams. Students may not take CLEP exams for credit once they have matriculated at Mason.

2. Certain university approved industry, government, or military training credits if such credits are indexed and recommended as college-level credit by the American Council on Education (ACE). To be eligible for Mason credit, training and course specifics must exactly match what is in the ACE guide and be approved for Mason credit. The specific credits must also be approved by the program director and the dean. A maximum of 45 credits can be earned through ACE-approved training. A maximum of 60 total combined credits can be accepted for exams and ACE-approved training. For example, if 45 credits are accepted by ACE-approved training, a maximum of 15 credits can be accepted for exams. Students may not take these courses for credit once they have matriculated at Mason.
3. Experiential learning demonstrated by portfolios subject to approval by the program director and the dean (30 maximum credits).
4. College-level credit earned at institutions accredited by bodies other than recognized regional accrediting organizations subject to approval by the program director and the dean. These credits can only be considered if the institution is listed in *Accredited Institutions of Postsecondary Education* published by ACE (30 maximum credits) and only if they are taken before the student matriculates at Mason.

Students may not pursue credit for options 1, 2, and 4 once they have matriculated at Mason. They must complete the third option within their first 30 credits after matriculation. Although the types of credit noted above may be applied to a bachelor of individualized study degree, if a BIS student changes majors, credit awarded in these ways cannot be used toward other majors. These nontraditional credits are not transferable to other degree programs at Mason.

**Degree Requirements**

Students pursuing an bachelor of individualized study degree must complete four required courses and one concentration.

All BIS students are encouraged to pursue a minor. For students pursuing the individualized study concentration, 15 credits of the minor must be applied uniquely to the minor and not to the concentration. For students pursuing the concentration in early childhood studies, the minor is required for the degree.

**General Education (36 credits)**

Like all students, BIS students complete university general education requirements. Students in the BIS program meet a modified general education program of 36 credits. Most students complete the general education requirements below.

Students pursuing the concentration in early childhood education studies meet general education requirements as specified in the advising agreement between NVCC and Mason: they complete 18 credits through NVCC coursework (lower level written communication [ENGH 101], oral communication [COMM 100], 6 credits of social sciences, MATH or STAT, and information technology) and 18-19 credits at Mason (upper level written communication [ENGH 302], 3 or 4 credits of natural science, 6 credits of humanities [including 3 credits of arts], 3 credits of social science, and 3 credits in synthesis [BIS 490]). The general education requirements may include courses not listed here, Consult the BIS program for more information.

Courses used to meet the general education requirements cannot be used to meet a requirement for a concentration.

**Two courses (6 credits) of English composition**

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3

**Three courses (9 credits) in humanities**

- Any ARTH course
- Any AVT course
- Any COMM course
- Any DANC course
- Any ENGH course (except for ENGH 100, 101, 302)
- Any MUSI course
- Any PHIL course (except for PHIL 173, 376)
Any RELI course
Any THR course
Any course from a foreign languages department

Three courses (9 credits) in social and behavioral science

Any ANTH course
Any CRIM course
Any ECON course
Any GGS course except for GGS 102, 309
Any GOVT course
Any HIST course
Any LING course
Any PSYC course
Any SOCI course
WMST 200 - Introduction to Women and Gender Studies Credits: 3

One course (3 credits) in mathematics or statistics chosen from:

MATH 106 - Quantitative Reasoning Credits: 3 or any MATH course above 106
STAT 250 - Introductory Statistics I Credits: 3
OM 210 - Statistical Analysis for Management Credits: 4

3 credits in information technology

IT 103 - Introduction to Computing Credits: 3 or any course that fulfills the general education IT proficiency requirement (all components including ethics)

3-4 credits in a natural science

This can be fulfilled by any 3-4 credit lab or non lab course.

Any ASTR course
Any BIOL course
Any CHEM course
Any CLIM course
Any EVPP course
Any EOS course
Any GEOL course
Any PHYS course
CONS 401 - Conservation Theory Credits: 3
GGS 102 - Physical Geography Credits: 3
• GGS 309 - Meteorology and Climate Credits: 3
• NCLC 301 - Science in the News Credits: 3
• NCLC 318 - Exploring Virginia's Watersheds Credits: 4
• NCLC 395 - Field-Based Work Credits: 1-18
• NCLC 401 - Conservation Biology Credits: 6
• UNIV 301 - Great Ideas in Science Credits: 3

One synthesis course (3 credits)

• BIS 490 - Senior Project Credits: 3

Four core courses (10 credits)

Students must complete each of the four core courses with a minimum grade of 2.00.

In BIS 390 (or 391 for students pursuing honors in the major), students develop a project proposal. An approved proposal from BIS 390 or 391 is a prerequisite to enroll in BIS 490.

In BIS 490, students complete a senior capstone project that varies according to the individual program of study. It may be an investigative or creative project, and it must be appropriate to the student’s interdisciplinary concentration. BIS 490 requires significant writing and fulfills the university general education synthesis requirement. The project is evaluated by the BIS 490 instructor in consultation with the student’s faculty mentor and others as determined by the BIS director.

BIS 490 and BIS 491 are taken concurrently when no more than 6 credits remain in the concentration.

The core courses:

• BIS 300 - Understanding Interdisciplinary Studies Credits: 3
• BIS 390 - The Research Process or BIS 391 - The Research Process for Honors Credits: 3
• BIS 490 - Senior Project Credits: 3
• BIS 491 - Senior Project Presentation Credits: 1

One concentration

Students must complete one concentration of 24-36 credits. Of the credits applied to the concentration, at least 15 credits must be at the 300 level or above and a maximum of 6 credits can have grades of C- or D (grades below 2.00). The total credits applied to the concentration must represent a minimum GPA of 2.00.

Courses applied to a concentration may not also be used to fulfill general education requirements.

▲ Individualized Concentration (IND)

Students may do an individualized concentration to meet their own academic needs and interests. The concentration is developed in close consultation with BIS staff and a faculty mentor. Students may incorporate into their individualized concentrations up to 9 credits of previously earned college course work or previously earned nontraditional credit from other institutions. In addition to the 4 core courses, students complete between 24 and 36 credits, depending on the topic and the student's preparation.
24 to 36 credits from a minimum of two disciplines

Students are encouraged to include BIS 489 - Directed Readings and Research in the concentration and complete it before taking BIS 490.

Total: 24-36 credits

▲ Concentration in Early Childhood Education Studies (ECES)

This concentration offers students holding a Northern Virginia Community College associate’s degree in applied science in early childhood development the opportunity to obtain a BIS in early childhood education studies and a minor in business. This concentration does not lead to teacher licensure in early childhood education. To receive this concentration, students complete 34 credits beyond the associates degree in addition to the 4 core BIS courses, electives, and general education requirements needed to reach at least 120 credits.

Admission Requirements

Students are eligible for this concentration if they have an associate’s degree in applied science in early childhood development. Unlike the individualized concentration, there is no restriction regarding number of years since high school graduation for admission into this BIS concentration.

Interdisciplinary courses (19 credits)

One course (3 credits) in human growth and development

- EDUC 302 - Human Growth and Development Credits: 3

One course (3 credits) focused on diverse young learners chosen from:

- ECED 402 - Foundations of Language and Literacy for Diverse Young Learners Credits: 3
- ECED 403 - Inclusive Curriculum for Young Learners: Planning Instruction and Guidance Credits: 3

One course (3 credits) in linguistic development of infants and toddlers chosen from:

- ECED 422 - Developing Language, Literacy, and Communication of Diverse Young Learners Credits: 3
- ECED 423 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches Credits: 3
One course (4 credits) in research methods chosen from

- GOVT 300 - Research Methods and Analysis Credits: 4
- SOCI 303 - Sociological Research Methodology Credits: 4

6 credits of electives at the 300-400-level

- Students choose 6 credits of electives relevant to the concentration in consultation with their faculty mentor.

Five courses (15 credits) leading to a minor in business

- MSOM 300 - Managing Financial Resources Credits: 3
- MSOM 301 - Managing People and Organizations Credits: 3
- MSOM 303 - Marketing in a Global Economy Credits: 3
- MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise Credits: 3
- MSOM 305 - Managing in a Global Economy Credits: 3

Note:

Students may petition to substitute another minor relevant to early childhood studies. A substitution requires the approval of the program director.

Total: 34 credits

Total: 34-46 credits

Bachelor's/Accelerated Master's Program

Individualized Study, BIS/Applied Information Technology, Accelerated MS

Highly qualified students in the Bachelor of Individualized Study (BIS) Program may apply to the Accelerated MS in AIT Program while they are undergraduate students. If accepted, accelerated students will be able to earn both a BIS (including 120 credits) and a MS (30 credits), with six credits of overlap permitted (total of 144 credits).
For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. Mason undergraduate students in the BIS Program can apply in the semester in which they will have completed 90 or more credits (including 15 Mason resident credits) applicable toward the BIS. Students must have an overall GPA of at least 3.30 to apply to the program. Criteria for admission are identical to criteria for admission into the MS in AIT Program, except that students do not need to have completed an undergraduate degree prior to acceptance into the accelerated program.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition Form.

Degree Requirements

Students in the accelerated master's program must maintain a minimum 3.30 GPA in the undergraduate segment until they have satisfied all requirements for the BIS degree. On completion and conferral of the undergraduate degree they submit the Bachelor's/Accelerated Master's Transition Form and are admitted to graduate status.

As graduate students, accelerated master's students have an advanced standing. Students must complete all credits that satisfy requirements of the BIS program and those of the MSAIT program, with two courses (6 credits) overlapping from the courses necessary to earn the BIS with a concentration IND (individualized), applied information technology emphasis as listed below.

Note: All of the prerequisite courses indicated below must be passed with a grade of C or higher.

Emerging Technologies

- AIT 597 - Developing IT Leaders of Integrity Credits: 3
- GSOM 540 - Analysis of Financial Decisions Credits: 3

Cyber Security

- AIT 673 - Cyber Incident Handling and Response Credits: 3
- ISA 650 - Security Policy Credits: 3

Intelligence Technologies
Any two from:

- AIT 675 - Overview of the National Intelligence Community Credits: 3
- AIT 676 - The Intelligence Cycle Credits: 3
- AIT 677 - Intelligence Analysis Methods Credits: 3
- AIT 678 - Intelligence Problems and Challenges Credits: 3

Individualized Study, BIS/Telecommunications, Accelerated MS

Students who are in the Bachelor of Individualized Study (BIS) Program may apply to the Accelerated MS in TCOM program while they are undergraduate students. The accelerated program is designed for qualified undergraduate students in the BIS Program who would like to proceed directly into the MS in TCOM program, completing the two degrees with 144 credits. Accelerated students must satisfy requirements for the BIS (including 120 credits) and the MS (30 credits), with 6 credits of overlap permitted. The MS in TCOM is on an accelerated track, with 6 credits taken as an undergraduate and 24 credits as a graduate student.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. Mason undergraduate students in the BIS Program may apply for the accelerated program in the semester in which they will have completed 90 or more credits (including 15 Mason resident credits) applicable toward the BIS. Students must have an overall GPA of at least 3.25 to apply for the program. Students who have not yet finished 90 credits may be accepted provisionally subject to satisfactory completion of 90 credits. Criteria for admission are identical to criteria for admission into the MS in TCOM Program, except that students do not need to have completed an undergraduate degree prior to acceptance into the accelerated program.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition Form.

Degree Requirements

Students who have been accepted into the accelerated program must maintain a minimum 3.25 GPA in the undergraduate segment of the accelerated program and a 3.00 GPA in the graduate segment. That is, after students have been accepted into the accelerated program, they must maintain a 3.25 GPA until they have satisfied all requirements for the BIS degree. They must then maintain a minimum 3.00 GPA in the graduate segment of the accelerated program.

Students must complete all requirements for the BIS degree. Students in the accelerated program must apply to have the BIS degree conferred the semester before they expect to complete BIS requirements, and must graduate. On completion and conferral of the undergraduate degree they submit the Bachelor's/Accelerated Master's Transition Form and are admitted to graduate status.
As graduate students, accelerated master's students have an advanced standing. Students must complete all credits that satisfy requirements of the BIS program and those of the MS-TCOM program, with two courses (6 credits) overlapping. The 6 undergraduate credits that may be taken by a BIS undergraduate student as part of the accelerated program must be selected from the list below, and will be substituted for BIS concentration courses, subject to prior approval by a BIS advisor.

Note: Accelerated students must take ECE 301 or 303 as one of their BIS courses taken to satisfy the Individualized Concentration (IND) with emphasis on telecommunication. All of the prerequisite courses indicated below must be passed with a grade of B or higher.

The MS in TCOM is granted on completion of all requirements for the accelerated degree.

Telecommunications courses:

- TCOM 500 - Modern Telecommunications Credits: 3
- TCOM 501 - Data Communications and Local Area Networks Credits: 1.5 (prerequisite: acceptance to accelerated program)
- TCOM 502 - Wide Area Networks and Internet Credits: 1.5 (prerequisites: TCOM 501, IT 341, or equivalent)
- TCOM 503 - Fiber Optic Communications Credits: 1.5 (prerequisite: TCOM 500 or equivalent)
- TCOM 504 - Asynchronous Transfer Mode Networks Credits: 1.5 (prerequisites: TCOM 501 and 502, IT 341, or equivalent)
- TCOM 505 - Networked Multicomputer Systems Credits: 1.5 (prerequisites: TCOM 501, IT 341, or equivalent)
- TCOM 509 - Internet Protocols Credits: 1.5 (prerequisites: TCOM 501 and 502, IT 341, or equivalent)
- TCOM 510 - Client-Server Architectures and Applications Credits: 1.5 (prerequisite: TCOM 505)
- TCOM 513 - Optical Communications Networks Credits: 1.5 (prerequisite: TCOM 503)
- TCOM 519 - Voice over IP Credits: 1.5 (prerequisites: TCOM 509, IT 341, or equivalent)
- TCOM 529 - Advanced Internet Protocols Credits: 1.5 (prerequisite: TCOM 509)
- TCOM 539 - Advanced Voice over IP Credits: 1.5 (prerequisite: TCOM 519)
- TCOM 551 - Digital Communication Systems Credits: 3 (prerequisite: TCOM 500 or equivalent)
- TCOM 607 - Satellite Communications Credits: 3 (prerequisites: ECE 463, TCOM 551, or equivalent)

Note:

Accelerated students who have passed IT 341 with a grade of B or higher will not be required to take TCOM 501 in the MS in TCOM core. They may take a 1.5-credit elective instead. Other TCOM courses may be approved on a case by-case basis.

BIS Concentration: 34-46 credits

Students who are pursuing the Individualized Study, BIS, individualized concentration (IND) and emphasis on telecommunications must take:

- Additional 500-level TCOM course (3)
- Plus an additional 9 to 21 credits to reach required number.
- BIS 300 - Understanding Interdisciplinary Studies Credits: 3
- BIS 390 - The Research Process Credits: 3
- BIS 490 - Senior Project Credits: 3
- BIS 491 - Senior Project Presentation Credits: 1

- ECE 301 - Digital Electronics Credits: 3

or
ECE 303 - Digital Design/Intro Assembly Language Credits: 4

IT 212 - Computer Hardware Fundamentals Credits: 3
IT 341 - Data Communications and Network Principles Credits: 3
TCOM 500 - Modern Telecommunications Credits: 3

■ Interdisciplinary Studies

Phone: 703-993-8762
Web: mais.gmu.edu

Executive Committee

Addleson, Axtell, Brown Leonard, Dakake, Ehrlich, Jordan, Kinnaman, Kuhta, Lont, Rodgers, Salmon, Shutika, Snyder-Hall (director), Vitzkova, Yocom

Course Work

This program offers the courses designated MAIS in the Courses chapter of this catalog. Students in this degree take most of their courses in the disciplines that they integrate as part of their degree program.

Graduate Programs

The master's degree program in interdisciplinary studies (MAIS) is designed for students who seek a degree that integrates knowledge from several disciplines. It addresses a rapidly evolving demand for specialized and individualized graduate study. Students choose one of ten structured concentrations or devise an individualized program of study when traditional degree programs do not meet their evolving careers or life goals.

The degree requires course work from a home department and selected courses from other disciplines. Students complete their degrees with a project or thesis.

Concentrations

Students pursuing a master's degree program in interdisciplinary studies can choose established concentrations in these areas:

- community college teaching
- computational social sciences
- energy and sustainability
- film and video studies
- folklore studies
- higher education
- neuroethics
- religion, culture, and values
- social entrepreneurship
- women and gender studies
For a variety of reasons, traditional graduate programs are not able to meet the specific educational goals of some students. They can choose an individualized concentration. With the help of a faculty advisor, they design an individualized program of study that includes courses from several academic disciplines.

**Bachelor's/Accelerated Master's Program**

**Bachelor's Degree (any)/Interdisciplinary Studies, Accelerated MAIS (Energy and Sustainability Concentration)**

Web: mais.gmu.edu

Highly qualified undergraduates in any major may apply to the accelerated master's degree in interdisciplinary studies. If accepted, and depending on their undergraduate major, students will be able to earn an undergraduate degree in their chosen major and a graduate degree in interdisciplinary studies with a concentration in energy and sustainability after satisfactory completion of 144 credits, sometimes within five years.

This program of study is offered by the Interdisciplinary Studies, MAIS.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in interdisciplinary studies, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. Upon completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

**Recommended Courses:**

Students pursuing this accelerated master's degree should consider taking PHYS 581, CSI 685, and ECON 695.

**Recommended Majors:**

Chemistry, economics, mathematics, physics, and relevant concentrations in the Bachelor of Individualized Study (BIS) degree.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the
permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

**Bachelor's Degree (any)/Interdisciplinary Studies, Accelerated MAIS (Folklore Studies Concentration)**

Web: mais.gmu.edu

Highly qualified undergraduates in any major may apply to the accelerated master's degree in interdisciplinary studies. If accepted, and depending on their undergraduate major, students will be able to earn an undergraduate degree in their chosen major and a graduate degree in interdisciplinary studies with a concentration in folklore studies after satisfactory completion of 144 credits, sometimes within five years.

This program of study is offered by the Interdisciplinary Studies, MAIS.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in interdisciplinary studies, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. Upon completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

**Recommended Courses:**

Students pursuing this accelerated master's degree can select from any folklore topics course at the 500 level. These courses include: Appalachian Folklore, Traditional Narrative and Storytelling, Folklore Cultural Heritage and Tourism, Living Words: Folklore and Creative Writing, Folklore of the Spirit World, Traditional Arts/Traditional Artists, Latin American Folklore.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.
To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

**Master’s Degree**

**Interdisciplinary Studies, MAIS**

**Banner Code:** LA-MAIS-ISIN

Web: mais.gmu.edu

The MA in interdisciplinary studies is for students who seek a master’s degree that integrates knowledge from several disciplines. It addresses the rapidly evolving demand for unique graduate study by promoting advanced scholarship that transcends traditional disciplinary boundaries.

Applicants must show a capacity for original thought in cross disciplinary research. There may be additional skills required of students applying to specific concentrations. Students will be admitted only if the program can assign to them a faculty advisor appropriate for the intended course of study.

Students can pursue one of the following structured interdisciplinary concentrations:

- Community college teaching (in communication, English, information systems, math, Spanish, or TESL)
- Computational social science
- Energy and sustainability
- Film and video studies
- Folklore studies
- Higher education (administration or student affairs)
- Neuroethics
- Religion, culture, and values
- Social entrepreneurship
- War and the military in society
- Women and gender studies

Students also have the opportunity to design an individualized concentration to meet the special needs of their careers.

- Individualized studies

This program of study is offered by the Interdisciplinary Studies Program.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter this catalog. For information specific to the MA in Interdisciplinary Studies, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**
Students pursuing this degree must successfully complete 36 credits of graduate course work in one of the concentrations below. Students must submit a curriculum contract that has been approved by their faculty adviser and the director.

Courses applied to the degree are subject to the following restrictions: a maximum of 6 credits may be earned through independent study or directed readings and research courses; a maximum of 6 credits may be taken through the Consortium of Universities of the Washington Metropolitan Area; a maximum of 15 credits may be transfer credits; a maximum of 6 of the transfer credits may be from other accredited institutions.

Transfer credits include credits taken before first enrolling as an admitted degree-seeking student (at another institution, in another Mason graduate program, or in Mason nondegree status) or credits taken at another institution after admission to the degree program (which requires prior written approval of the director and the dean).

All students complete their work in the program with a project or thesis. Students electing to complete the concentration in community college teaching with a thesis will complete 38 credits.

▲ Concentration in Community College Teaching (CCT)

This concentration qualifies students to teach entry-level courses in rapidly growing fields at community colleges. In addition, it may be an appropriate graduate credential for some faculty currently teaching in community colleges.

In addition to required courses and a knowledge area, students pursuing this concentration are required to take a one-credit proposal course and complete a project or thesis. The concentration in community college teaching is administered by the Higher Education Program.

One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Four required courses (12 credits) in college teaching

- CTCH 601 - The Community College Credits: 3
- CTCH 602 - College Teaching Credits: 3
- CTCH 603 - Technology in Higher Education Credits: 3
- CTCH 685 - Practicum Credits: 3

Seven required courses (21 credits) in a knowledge area chosen from the following:

- communication
- English
- information systems
- mathematics
- Spanish
- teaching English as a second language

Communication
Four core courses (12 credits)

- COMM 602 - Theories and Research of Mass Communication Credits: 3 or COMM 634 - Theories of Interpersonal Communication Credits: 3
- COMM 605 - Intercultural Communication Credits: 3 or COMM 635 - Organizational Communication Credits: 3
- COMM 650 - Research Methodologies in Communication Credits: 3
- COMM 653 - Graduate Communication: Research and Teaching Credits: 3

Three elective courses (9 credits):

Electives are chosen from graduate-level communication courses in consultation with a faculty advisor. They may include core courses listed above not already used to meet the 12 credit requirement.

Knowledge area total: 21 credits

English

Two to three core courses (6-9 credits):

- ENGH 701 - Research in English Studies Credits: 3
- ENGH 610 - Proseminar in Teaching the Reading of Literature Credits: 3 and/or ENGH 615 - Proseminar in Composition Instruction Credits: 3

Four to five elective courses (12-15 credits)

Electives are chosen from graduate-level English courses in consultation with a faculty advisor.

Knowledge area total: 21 credits

Information Systems

Three core courses (9 credits)
• INFS 515 - Computer Organization Credits: 3
• INFS 612 - Principles and Practices of Communication Networks Credits: 3
• INFS 614 - Database Management Credits: 3

Four elective courses (12 credits)

Electives must be graduate-level INFS or INFS-related courses chosen in consultation with a faculty advisor.

Knowledge area total: 21 credits

Mathematics

Two core courses (6 credits)

• MATH 621 - Algebra I Credits: 3
• MATH 675 - Linear Analysis Credits: 3

Five elective courses (15 credits)

Electives are from graduate-level courses in mathematics and related disciplines (including statistics) chosen in consultation with a faculty advisor.

Knowledge area total: 21 credits

Spanish

Three core courses (9 credits)

• SPAN 502 - Hispanic Sociolinguistics Credits: 3
• SPAN 505 - Applied Spanish Stylistics Credits: 3
• SPAN 510 - Introduction to the Graduate Study of Literature in Spanish Credits: 3

Four elective courses (12 credits)
At least three elective courses (9 credits) must be graduate-level SPAN courses; one (3 credits) may be a graduate-level FRLN course. Electives should be chosen in consultation with a faculty advisor.

Knowledge area total: 21 credits

Teaching English as a Second Language

Six core courses (18 credits)

- LING 520 - Introduction to Linguistics Credits: 3
- LING 521 - Applied Linguistics: Teaching English as a Second Language Credits: 3 or LING 507 - Field Work in Applied Linguistics Credits: 3
- LING 522 - Modern English Grammar Credits: 3
- LING 523 - English Phonetics Credits: 3
- LING 525 - Practicum in ESL Credits: 3
- LING 582 - Second Language Acquisition Credits: 3

One elective course (3 credits)

Elective should be from graduate-level courses in linguistics or a related area chosen in consultation with a faculty advisor.

Knowledge area total: 21 credits

Proposal (1 credit)

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (1 credit) or thesis (3 credit)

- MAIS 798 - Interdisciplinary Studies Project Credits: 1-5
  or
- MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 3 credits)

Total: 36-38 credits
Concentration in Computational Social Science (CSS)

Computational Social Science (CSS) is a relatively new interdisciplinary science in which social science questions are investigated with modern computational tools. Computational social scientists investigate complex social phenomena such as economic markets, traffic control, and political systems by simulating the interactions of the many actors in such systems on computers. They hope to gain insights which will lead to better management of the behavior of the larger social systems, i.e., prevention of market crashes, smoothed traffic flow, or maintenance of political stability. The intractability of many social problems calls for the new approaches provided by computational social science.

CSS is a highly interdisciplinary field that requires teams to plan and complete projects, be they undertaken by government, industry, or non-profit entities. Project managers of such teams, overseeing all elements of project design and execution, tend to hold PhDs. The MAIS concentration will train students to be members of these project teams, able to meaningfully contribute to background research and to project design, execution, and communication.

Prior background should include a bachelor’s degree in one of the social sciences, in computer science, in engineering, or in a relevant discipline, as well as undergraduate courses in these and related areas. Bachelor’s degrees in other areas are also eligible, but the student may be required to take additional courses in social science, mathematics, or computer science as prerequisites to admission.

One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Six core courses (18 credits)

Three required courses (9 credits)

The required CSS courses provide an understanding of the conceptual, technical, and practical foundations of computational social science.

- CSS 600 - Introduction to Computational Social Science Credits: 3
- CSS 605 - Object-Oriented Modeling in Social Science Credits: 3
- CSS 610 - Computational Analysis of Social Complexity Credits: 3

Three elective courses (9 credits) chosen from:

The electives provide an understanding of the technical foundations and current work in at least two subfields of computational social science.

- CSS 620 - Origins of Social Complexity Credits: 3
- CSS 625 - Complexity Theory in the Social Sciences Credits: 3
- CSS 645 - Spatial Agent-Based Models of Human-Environment Interactions Credits: 3
- CSS 692 - Social Network Analysis Credits: 3
• CSS 739 - Topics in Computational Social Science Credits: 3

One research course (3 credits) chosen from:

The research course provides students with exposure to the most current ongoing research in the field and allows them to further develop their computational research expertise.

• CSS 796 - Directed Reading and Research Credits: 3
• CSS 898 - Research Colloquium in Computational Social Science Credits: 1
• CSS 899 - Colloquium in Computational Social Science Credits: 1

Three to four elective courses (9-12 credits)

The electives allow students to acquire a substantive specialization as well as additional training in social and computational science. Because of the broad spectrum of social science phenomena, methodologies, and student backgrounds, there is a large pool of potential courses. Electives may include any Mason master’s-level course in computational social science, social science, computer science, statistics, or other quantitative methods such as data visualization, information technology, and geographic information science. Electives should be selected in conjunction with and approval of the student’s advisor and the Director of CSS Graduate Studies. If the student does not have prior coursework in multivariate statistical analysis, the electives should include at least one such course relevant for the student’s chosen specialization.

Students who elect to do a 4-credit project or thesis take 9 elective credits. Students who do a 1-credit project take 12 elective credits.

Proposal (1 credit)

• MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (1-4 credits) or thesis (4 credits)

• MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (minimum of 1 credit)
or
• MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

▲ Concentration in Energy and Sustainability (EAS)
This concentration is particularly relevant for students who are pursuing or interested in pursuing careers in energy and environmentally related applications in the law, national and international policy, government, print and media journalism, public and social service, teaching, advanced graduate studies, ethics, business, and basic and applied research.

Sustainability by definition aims to meet our present needs without compromising the ability of future generations to meet their needs. A sustainability education lies within the intersection of environmental science and engineering, economics and business, public policy, and many other areas. Energy is a crucial component of sustainability.

One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Two to three policy courses (6-9 credits) chosen from:

- ECON 695 - Special Topics in Economics Credits: 3
- EVPP 505 - Selected Topics in Environmental Science Credits: 0-4 (take 3 credits)
- EVPP 638 - Corporate Environmental Management and Policy Credits: 3
- PHIL 643 - Environmental Ethics Credits: 3
- PUBP 710 - Topics in Public Policy Credits: 1-3 (take 3 credits)

Two to four courses (6-12 credits) in planning, modeling, and management chosen from:

- CEIE 501 - Sustainable Development Credits: 3
- CEIE 601 - Infrastructure Modeling Credits: 3 or CEIE 671 - Best Engineering Management Practices Credits: 3
- EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1 (can be repeated for credit)
- EVPP 693 - Directed Studies in Environmental Science and Public Policy Credits: 1-4

Two to five courses in basic science (6-15 credits)

One required course (3 credits)

- PHYS 580 - Selected Interdisciplinary Topics Credits: 3
  or
- PHYS 581 - Topics in Renewable Energy Credits: 3
One to four courses (3-12 credits) chosen from:

- CSI 685 or PHYS 615 - Fundamentals of Materials Science Credits: 3
- CSI 720 - Fluid Mechanics Credits: 3
- CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3
- PHYS 614 - Thermodynamics and Kinetics of Materials Credits: 3

One research methods course (3 credits)

- CSI 700 - Numerical Methods Credits: 3
- OR 682 - Computational Methods in Engineering and Statistics Credits: 3
- OR 763 - Research Methods in Systems Engineering and Information Technology Credits: 3 or
- SOCI 620 - Methods and Logic of Social Inquiry Credits: 3
- SYST 763 - Research Methods in Systems Engineering and Information Technology Credits: 3

Proposal (1 credit)

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (1-4 credits) or thesis (4 credits)

- MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (minimum of 1 credit)
  or
- MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

▲ Concentration in Film and Video Studies (FAVS)

The concentration emphasizes film and video studies and its components including videoconferencing, multimedia, and editing. As low-end, high-quality video equipment becomes more affordable, more organizations (for profit and nonprofit) are investing in in-house production studios and staff. Their needs include traditional videography, videoconferencing, web design, multimedia, and digital editing.
Five academic units offer courses relevant to the concentration: Within the College of Humanities and Social Sciences, the English Department offers a course in film theory. College of Education and Human Development offers courses in interactive and distance learning, which provide a background for pedagogy and a wide spectrum of interactive skills. Within the College of Visual and Performing Arts, the Communication Film and Video Studies program offers courses in the theory and practice of video production and screenwriting and the Art and Visual Technologies Department offers courses on computer-mediated visual applications, including the study of multimedia tools and design, digital and electronic art, animation, and virtual reality.

Students must have a basic knowledge of video production. Students with little or no video experience must take FAVS 599 Seminar in Video Production within the first 9 credits of the program. Students with video experience who wish to waive this requirement must provide a demo reel of their past work.

One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Five to six required courses (16-19 credits)

- FAVS 599 - Special Topics Credits: 1-6 (take 3 credits when topic is Video Production)
  This requirement may be waived by the director for students with a video production background. They take an additional 3 credits of electives.
- FAVS 570 - Screenwriting Credits: 3
- ENGH 670 - Visual Culture: Theories and Histories Credits: 3
  or
- COMM 655 - Theories of Visual Communication in Telecommunications Credits: 3
- AVT 676 - Graduate Sound Art Credits: 4
  or
- AVT 599 - Special Topics in Art and Visual Technology Credits: 1-6 (take 4 credits)
- FAVS 550 - Internship Credits: 3
- FAVS 590 - Independent Study Credits: 1-6 (take 3 credits)
  or
- FAVS 597 - Independent Production Credits: 1-3 (take 3 credits)

Three to five elective courses (12 to 15 credits)

The number of elective credits will vary depending on whether required introductory course is waived.

- AVT 620 - Theory, Criticism, and the Visual Arts Credits: 3
- AVT 685 - Video Art Credits: 4
- FAVS 599 - Special Topics Credits: 1-6 (take 3 credits)
- COMM 590 - Seminar in Communication Credits: 3
• COMM 602 - Theories and Research of Mass Communication Credits: 3
• COMM 696 - Directed Readings and Research Credits: 1-3 (take 3 credits)
• EDIT 571 - Tools for Visual/Graphic Design Credits: 1-3 (take 3 credits)
• EDIT 572 - Tools for Digital Video and Audio Credits: 1-3 (take 3 credits)
• ENGH 555 - Introduction to Cinema Studies Credits: 3
• HIST 697 - Creating History in New Media Credits: 3

Proposal (1 credit)

• MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project or thesis (3 credits)

• MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (take 3 credits)
or
• MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 3 credits)

Total: 36 credits

▲ Concentration in Folklore Studies (FLKS)

This concentration explores the processes of tradition that move through multiple expressive forms, such as folktales, folk beliefs, folk medicine, folk art, folksong, and literature. A discipline based on ethnographic fieldwork, folklore offers students a chance to work in communities and collect living traditional materials that are critical to human identity and values. Interdisciplinary by nature, folklore thrives on local particularities and compelling global connections. Internships in the many Washington, D.C., metropolitan area folklore organizations are central to students’ experiences. This course of study prepares students for careers in cultural agencies, governmental organizations, teaching institutions, and advanced study in the humanities.

Students pursuing this concentration must complete at least 6 credits of courses from outside the English Department.

One required course of proseminar (1 credit)

• MAIS 796 - MAIS ProSeminar Credits: 1

Six core courses (18 credits)
Special topics in folklore (9 credits) chosen from:

Courses may be repeated.

- ENGH 590 - Topics in Folk Narrative Credits: 3
- ENGH 591 - Topics in Folklore Studies Credits: 3
- ENGH 681 - Advanced Topics in Folklore Studies Credits: 3
- ENGH 798 - Directed Reading and Research Credits: 1-6 (take 3 credits)

Pathways in folklore scholarship (3 credits)

- ENGH 681 - Advanced Topics in Folklore Studies Credits: 3 (when topic is Pathways to Folklore Scholarship)

Internship in folklore (3 credits)

- ENGH 604 - Internship in Folklore Credits: 1-6 (take 3 courses)

Research methodology course (3 credits) chosen from:

- ENGH 701 - Research in English Studies Credits: 3
- HIST 610 - The Study and Writing of History Credits: 3
- SOCI 634 - Qualitative Research Methods Credits: 3

Specialization (9 credits)

Students choose an area of specialization which must be approved by a faculty advisor. Specialization topics include public folklore (museums, archives, arts and humanities councils, and nonprofit organizations); folklore (ethnicity and immigration); folklore and literature; folklore and the teaching of writing and literature; folklore and history; and folklore and conflict resolution. Students can also opt for open specialization, with courses chosen in consultation with advisor. Possibilities include folklore and editing, applied storytelling, folklore and mythology, folklore and art history, folklore and gender studies, and folklore and communication.

One to two elective courses (3 to 6 credits)

Electives require the prior written approval of a faculty advisor. Student who elect to do a 1 credit project take 6 elective credits. Students who do a 4 credit thesis take 3 elective credits.

Proposal (1 credit)

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1
Project (1 credit) or thesis (4 credits):

- MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (take 1 credit)
  or
- MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

▲ Concentration in Higher Education (HEDU)

This concentration prepares individuals for administrative and leadership positions in colleges and universities, associations, and government agencies whose activities affect higher education. Within the concentration, students may choose to emphasize administration or student affairs.

One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Four core courses (12 credits)

One course (3 credits) chosen from:

- CTCH 621 - Higher Education in the United States Credits: 3
- CTCH 601 - The Community College Credits: 3

Three additional core courses (9 credits)

Students choose relevant courses in consultation with an advisor.

One course (3 credits) of research methodology

One course (3 credits) of specialization
• CTCH 622 - Organization and Administration in Higher Education Credits: 3
  or
• CTCH 644 - Student Services in Higher Education Credits: 3

Three to four elective courses (9-12 credits)

Students chose electives in consultation with their advisor. The number of elective credits will vary depending on the number of project credits.

Practicum (3 credits)

• CTCH 685 - Practicum Credits: 3

Proposal (1 credit)

• MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (1-4 credits) or thesis (4 credits)

• MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (minimum of 1 credit)
  or
• MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

▲ Individualized Concentration (IND)

This concentration is for students who wish to design a graduate program to meet the special needs of their careers and life plans. Students usually choose this option because traditional graduate programs do not meet their specific goals. Students, with help from their faculty advisor, design a unique program of study that includes courses from several academic departments.

Students have access to most graduate courses offered by Mason but must meet all course prerequisites. Each student must submit a curriculum contract approved by the student's advisor and director during the first semester enrolled. Any subsequent amendments must have the approval of the student's advisor and the director.

One required course of proseminar (1 credits)
MAIS 796 - MAIS ProSeminar Credits: 1

Disciplinary focus (12 to 18 credits)

Students must complete a minimum of 12 and a maximum of 18 credits in one discipline.

Complementary disciplines (9 to 18 credits)

Students take 9-18 courses in complementary disciplines. These require the approval of faculty advisor and MAIS director.

Research methods (3 credits)

Students take a research methods course approved by faculty advisor and MAIS director.

Proposal (1 credit)

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (1-4 credits) or thesis (4 credits)

- MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (minimum of 1 credit)
  or
- MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

▲ Concentration in Neuroethics (NETH)

The concentration in neuroethics offers students the opportunity to study ethical issues arising from recent scientific and medical advances in conjunction with advanced training in neuroscience. The curriculum helps students develop their skills in critical, analytical, and imaginative thinking and to make well-founded ethical decisions. Students will become familiar with the basic theories of current neuroscience, as well as the philosophical issues raised by these theories.

The degree is intended for students interested in doctoral work in neuroscience, cognitive science, or bioethics. It also can help students who will work on medical and scientific research projects in government or the private sector.

This concentration is offered jointly by the Department of Philosophy and the Neuroscience Program.
Admission to the neuroethics concentration is open to students with undergraduate degrees in any field. All students should have taken the following basic courses in life science and philosophy (or their equivalents) before admission to the program or should complete them shortly thereafter: PHIL 173, BIOL 213, BIOL 482, CHEM 314.

Students without the biology and chemistry pre-requisites can fill these requirements once admitted to the program by taking NEUR 600 and other courses recommended by the concentration director. These courses cannot be applied to degree requirements.

One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Six core courses (18 credits) in ethics and neuroscience

- PHIL 640 - History of Ethical Theory Credits: 3
- PHIL 642 - Biomedical Ethics Credits: 3
- PHIL 645 - Research Ethics Credits: 3
- NEUR 741 - Introduction to Neuroimaging Credits: 3
- NEUR 742 - Cognitive Neuroscience Credits: 3
- NEUR 602 - Cellular Neuroscience Credits: 3

12 credits of electives

Students must take at least 3 credits of philosophy and 3 credits of science. Other philosophy or neuroscience courses may be used to meet this requirement with prior written approval of the director of the program.

- PHIL 621 - Philosophy of Science Credits: 3
- PHIL 643 - Environmental Ethics Credits: 3
- PHIL 733 - Current Issues in Cognitive Science Credits: 3
- PSYC 527 - Introduction to Neurobiology Credits: 2
- PSYC 531 - Mammalian Neurobiology Credits: 3
- PSYC 557 - Psychometric Methods Credits: 3
- PSYC 685 - Cognitive Neuroscience Credits: 3
- PSYC 701 - Cognitive Bases of Behavior Credits: 3
- PSYC 702 - Biological Bases of Human Behavior Credits: 3
- BIOL 572 - Human Genetics Credits: 3
- NEUR 702 - Research Methods Credits: 3

Proposal (1 credit)

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1
Project or thesis (4 credits)

Students cap their study of neuroethics by writing a master’s thesis or completing a two-semester project in neuroethics. The project involves student observation and involvement in scientific research, clinical work, or policy setting.

- MAIS 798 - Interdisciplinary Studies Project Credits: 1-5
- MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5

Total: 36 credits

▲ Concentration in Religion, Culture, and Values (RCV)

This concentration is particularly relevant for students who are interested in careers in law, national and international government, print and media journalism, library sciences, archives and museums, public and social service, teaching, advanced graduate studies, and religious communities and institutions.

One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Two core courses (6 credits) chosen from:

- RELI 630 - Approaches to the Study of Religion Credits: 3
- RELI 631 - Sacred as Secular in Modern Spirituality Credits: 3
- RELI 632 - World Religions in Conflict and Dialogue Credits: 3
- RELI 635 - World Religions in Transition and Transformation Credits: 3

Two or three courses (6 to 9 credits) in religious studies chosen from:

- RELI 591 - Special Topics in Religious Studies Credits: 3 (may be repeated for credit)
- RELI 633 - Ethical Perspectives of World Religions Credits: 3
- RELI 636 - Religion and the Natural Environment Credits: 3
- RELI 642 - Sacred Language, Scripture, and Culture Credits: 3

One course in research methodology (3 credits) chosen from:

- HIST 610 - The Study and Writing of History Credits: 3
- SOCI 634 - Qualitative Research Methods Credits: 3
Two or three courses in a specialization (6 to 9 credits)

Specialization in religion, culture, and communication

Students take the course below and one or two other relevant courses chosen in consultation with an advisor.

- COMM 605 - Intercultural Communication Credits: 3

Specialization in religious traditions and conflict analysis and resolution

- CONF 695 - Selected Topics Credits: 3 (if appropriate)
- CONF 702 - Peace Studies Credits: 3
- CONF 722 - Conflict and Religion Credits: 3

Specialization in religion, culture, and ethics

- RELI 633 - Ethical Perspectives of World Religions Credits: 3
- PHIL 640 - History of Ethical Theory Credits: 3
- PHIL 643 - Environmental Ethics Credits: 3

Specialization in religion, values, and international politics

- GOVT 540 - International Relations Credits: 3
- GOVT 741 - Advanced Seminar in International Politics Credits: 3 (if appropriate)

One to four elective courses (3 to 12 credits)

Students chose electives in consultation with their advisor, bearing in mind the their specialization, project, or thesis topic. Any of the courses under the specializations listed above or courses from other disciplines listed below may be used as electives.

- ANTH 535 - Anthropology and the Human Condition: Seminar I Credits: 3
- ANTH 615 - Ritual and Power in Social Life Credits: 3
- ANTH 684 - Independent Study in Sociocultural Anthropology Credits: 1-6
- COMM 605 - Intercultural Communication Credits: 3
- CONF 695 - Selected Topics Credits: 3
- CONF 702 - Peace Studies Credits: 3
- CONF 722 - Conflict and Religion Credits: 3
• EDUC 537 - Foundations of Multicultural Education Credits: 3
• ENGH 591 - Topics in Folklore Studies Credits: 3
• GOVT 540 - International Relations Credits: 3
• GOVT 741 - Advanced Seminar in International Politics Credits: 3
• HIST 510 - Approaches to Modern World History Credits: 3
• PHIL 604 - Augustine and Aquinas Credits: 3
• PHIL 617 - Movements and Issues in the History of Political Philosophy Credits: 3
• PHIL 640 - History of Ethical Theory Credits: 3
• PHIL 643 - Environmental Ethics Credits: 3
• SOCI 614 - Sociology of Culture Credits: 3
• WMST 640 - Women and Global Issues Credits: 3

Proposal (1 credit)

• MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (1-4 credits) or thesis (4 credits)

• MAIS 798 - Interdisciplinary Studies Project Credits: 1-5
  or
• MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

▲Concentration in Social Entrepreneurship (SOCE)

This concentration promotes advanced scholarship that transcends traditional disciplinary boundaries. Students combine required coursework in social entrepreneurship, management, public policy, public and international affairs, and leadership with courses aimed at individual student's areas of specialization and hands on learning activities. Through this powerful blend of academic courses and experiential learning opportunities (i.e., the practical and the theoretical), students will graduate with the knowledge of leading edge concepts and research-based approaches, as well as the field experience necessary to succeed as social innovators.

Students earning an MAIS with a concentration in social entrepreneurship will learn about the roles that technology, public policy, market based approaches, research, leadership, strategy, and communication play in implementing solutions to urgent challenges around the globe. Whether they work in government, industry, or the citizen (non-profit) sector, these future leaders will be exposed to cutting edge knowledge related to sustainability, ethical leadership, strategic management, and working effectively within complex networks made up of divergent groups of stakeholders. Further, students will be equipped with the experience, strategic knowledge, technical support, and the social networks needed to create, operate, develop and accelerate startups, bring ideas to scale, and improve program effectiveness.
One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Three core courses (9 credits)

Students take three core courses in social entrepreneurship and leadership.

- NCLC 595 - Experiential Learning Credits: 1-3 (take 3 credits when topic is Foundations of Social Innovation)
- NCLC 595 - Experiential Learning Credits: 1-3 (take 3 credits when topic is Leading Social Change)
- PUAD 658 - Social Entrepreneurship and Nonprofit Enterprise Credits: 3
  or
- PUBP 761 - Social Entrepreneurship and Public Policy Credits: 3

Three courses (9 credits) in interdisciplinary perspectives on social entrepreneurship

Students take one course from each of areas below.

Public Policy

- PUBP 761 - Social Entrepreneurship and Public Policy Credits: 3 (if not taken as a core course)
- ITRN 769 - International Entrepreneurship Credits: 3
- PUBP 781 - Entrepreneurship and Economic Development Credits: 3
- PUBP 784 - Entrepreneurship, Economics, and Public Policy Credits: 3

Management

- MBA 674 - Ethical and Social Environment of Business in the 21st Century Credits: 1.5
- MBA 711 - Entrepreneurship Credits: 3
- MBA 714 - Managing Growth of Small Businesses Credits: 3
- MBA 719 - Entrepreneurship Laboratory Credits: 1.5
- MBA 752 - Turning Ideas into Successful Companies Credits: 3

Public Administration

- PUAD 505 - Introduction to Management of Nonprofits Credits: 3
- PUAD 654 - The Community, Marketing, and Public Relations Credits: 3
Disciplinary Focus (9 credits)

Students complete 9 credits in one discipline chosen in consultation with a faculty advisor. Possible areas include existing courses in health and human services, education and human development, public and international affairs, engineering, management, conflict and resolution, or public policy.

Internship (3 credits)

Students must complete an internship before registering for MAIS 798/799.

Proposal (1 credit)

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (4 credits) or thesis (4 credits)

- MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (take 4 credits)
  or
- MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

▲ Concentration in War and the Military in Society (WMS)

Recent events have demonstrated the degree to which military issues affect social groups, global politics, and the world economy. Understanding the ways in which armies are raised and funded, the reasons troops serve, the conditions military personnel and civilians endure during wartime, and the multifaceted and evolving ways in which nations conceive of the military apparatus has direct bearing on future policy decisions.

The MA in interdisciplinary studies with a concentration in war and the military in society emphasizes scholarship that examines issues of international security and conflict in the past, present, and future. It equips students with the skills to understand the interconnected nature of those elements and to examine critically the ways in which they have changed and continue to change over time.
One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Four core courses (12 credits)

Two courses (6 credits) chosen from:

- ANTH 721 - Culture, Power, and Conflict Credits: 3
- BIOD 610 - Advanced Topics in Biodefense Credits: 1-4 (take 3 credits; when topic is U.S. military intervention since Vietnam)
- GOVT 745 - International Security Credits: 3
- PUAD 632 - Terrorism: Theory and Practice Credits: 3

Two courses (6 credits) chosen from:

HIST 615 may be repeated for credit when topics differ.

- HIST 615 - Problems in American History Credits: 1-6 (when topics are readings in military history, the American Civil War, the Vietnam War, or other relevant topics relevant to military studies)

Six to seven elective courses (18-21 credits)

Students choose electives in consultation with an advisor, bearing in mind their specialization and proposed topic for their project or thesis. Students interested in the intellectual consideration of the military, war, and society should choose courses in anthropology, history, religious studies, and sociology. Students interested in practical applications of the study of the military, war, and society to contemporary security issues should choose courses in biodefense, geography, and government. Students may take additional courses from the core requirements as electives with permission from their advisor, but their coursework overall must include at least six credits in two or more disciplines.

Students who choose to do a project complete seven elective courses (21 credits); those who choose a thesis, six (18 credits).

- ANTH 699 - Contemporary Issues in Sociocultural Anthropology Credits: 3 (when topic is warfare, violence, and sacrifice in antiquity)
- BIOD 609 - Biodefense Strategy and Policy Credits: 3
- BIOD 706 - Nuclear, Biological, and Chemical Weapons Policy and Security Credits: 3
- GGS 590 - Selected Topics in Geography Credits: 1-3 (when topic is military geography or insurgency)
- GOVT 758 - Homeland/Transportation Security Administration Credits: 3
- HIST 615 - Problems in American History Credits: 1-6 (when topic is war and remembrance)
- HIST 635 - Problems in European History Credits: 3 (when topic is the fall of the Roman empire)
- RELI 632 - World Religions in Conflict and Dialogue Credits: 3
Proposal (1 credit)

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (1-4 credits) or thesis (4 credits)

- MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (minimum of 1 credit)
  or
- MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

▲ Concentration in Women and Gender Studies (WGST)

Of the coursework required for this concentration as described below, at least 15 credits must be in courses related to the study of women and gender and 12-18 credits in courses in a disciplinary focus. All courses related to the study of women and gender must be approved by the head of the concentration in women and gender studies.

One required course of proseminar (1 credit)

- MAIS 796 - MAIS ProSeminar Credits: 1

Two core courses (6 credits)

- WMST 630 - Feminist Theories across the Disciplines Credits: 3
- WMST 640 - Women and Global Issues Credits: 3

Disciplinary focus (12 credits)

Students complete 12 credits in one discipline chosen in consultation with a faculty advisor, including 3 credits in a course that addresses the study of women and gender.

Elective courses (9 to 12 credits)
Students must take at least 6 credits in courses that address the study of women and gender and that are not part of the disciplinary focus.

Research methods (3 credits)

The research methods course is selected in consultation with a faculty advisor.

Proposal (1 credit)

- MAIS 797 - Interdisciplinary Studies Proposal Credits: 1

Project (1-4 credits) or thesis (4 credits)

- MAIS 798 - Interdisciplinary Studies Project Credits: 1-5 (minimum 1 credit)
  or
- MAIS 799 - Interdisciplinary Studies Thesis Credits: 1-5 (take 4 credits)

Total: 36 credits

Latin American Studies

Phone: 703-993-1010
Web: las.gmu.edu

Faculty

Berroa (Modern and Classical Languages), Bristol (History and Art History), Burt (Public and International Affairs), Greet (History and Art History), Karush (History and Art History, director), Leeman (Modern and Classical Languages), Lepore (Dance), Meyer (Economics), Rabin (Modern and Classical Languages), Rogers (Modern and Classical Languages), Seligmann (Sociology and Anthropology), Shutika (English), Vivancos-Pérez (Modern and Classical Languages), Yocom (English)

Course Work

The Latin American Studies Program offers courses designated LAS in the Courses chapter of this catalog. As an interdisciplinary program, Latin American Studies offers many other courses across a range of departments that do not bear the LAS code. For the major and minor, students should consult with the director to determine whether a particular course may be used to fulfill a Latin American studies requirement or elective.

Undergraduate Programs
The bachelor’s degree in Latin American studies presents students with the opportunity to study one of the world’s most diverse and fascinating regions. Contemporary Latin America is the product of a long and turbulent history of conquest, resistance, and cultural mixing. The result is a rich and unique amalgam of African, indigenous, and European cultures. Understanding these complex societies has never been more crucial than it is today since people of Latin American descent represent more than 13% of the population of the United States. Knowledge of Latin American history, culture, society, and politics is indispensable for anyone who seeks to understand the contemporary United States and its place in the world.

Majors in Latin American studies develop a broad expertise in the region while pursuing an individualized program of study that suits their own particular interests. Student improve their language skills and take courses in many disciplines including anthropology, dance, economics, folklore, geography, government, history, and literature. The course work culminates in a seminar where students develop a research project under the mentorship of a faculty expert.

**Honors in the Major**

Latin American Studies majors who have completed 75 credits (a minimum of 15 in Latin American Studies, 6 of which must have been taken at Mason) with an overall minimum GPA of 3.50 and a minimum GPA of 3.50 in the major may apply to pursue advanced work leading to graduation with honors in the major. The application consists of a transcript, a recommendation from one member of the LAS faculty, and a brief description of a proposed research project.

Once accepted into the program, students pursuing honors in the major complete a two-course sequence LAS 491 and 499 (an honors section), which must be taken in successive semesters. In this sequence, students complete an advanced research project under the guidance of an faculty member. To graduate with honors in the major, students must earn a minimum GPA of 3.50 in the honors courses.

**Undergraduate Degree**

**Latin American Studies, BA**

**Banner Code: LA-BA-LAS**

Web: las.gmu.edu

This program of study is offered by the Latin American Studies Program.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

**Degree Requirements**

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in Latin American studies must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 31 credits in Latin American studies with a minimum GPA of 2.00.

**One required introductory course (1 credit)**

- LAS 100 - Introduction to Latin American Studies Credits: 1
Two required courses in (6 credits) in history

- HIST 271 - Survey of Latin American History Credits: 3
- HIST 272 - Survey of Latin American History Credits: 3

Two social science courses (6 credits) related to Latin America chosen from:

- ANTH 302 - Peoples and Cultures of Latin America Credits: 3
- ECON 361 - Economic Development of Latin America Credits: 3
- GGS 316 - Geography of Latin America Credits: 3
- GOVT 331 - Government and Politics of Latin America Credits: 3

One humanities course (3 credits) related to Latin America chosen from:

- ENGH 315 - Folklore and Folklife Credits: 3
- SPAN 322 - Introduction to Latin American Culture Credits: 3
- SPAN 325 - Major Hispanic Writers Credits: 3

One seminar course (3 credits):

- LAS 499 - Research Seminar in Latin American Studies Credits: 3

Four elective courses (12 credits) in Latin American studies

Students may satisfy the electives requirement with any course that contains a significant emphasis on Latin America or the culture, politics, sociology, or history of Latinos living in the United States. In addition, students are strongly encouraged to use an internship (LAS 490) or a study-abroad program to fulfill some of these credits. The electives must be approved by the director of the program.

Language requirement

All Latin American studies majors must demonstrate reading, speaking, or writing knowledge of Spanish or Portuguese by exam or achieving a minimum grade of 2.00 in a 300-level course in the language selected. Upper-level Latin American literature or culture courses taught in Spanish or Portuguese may be used to satisfy the electives requirement.

Total: 31 credits

Writing-Intensive Requirement
The university requires all students to complete at least one course designated "writing intensive" in their major at the 300 level or above. Students majoring in Latin American studies should consult with the director for a course to fulfill this requirement.

**Undergraduate Interdisciplinary Minor**

**Latin American Studies Minor**

**Banner Code: LAS**

Web: las.gmu.edu

Latin American Studies focuses on the diverse and connected regions, societies, and cultures of Latin America. Students find that combining this minor with a major in another discipline is particularly attractive to employers. Latin American studies enhances a major in Spanish or anthropology for a career in teaching or human rights work; a major in communication for a career in journalism; and a major in business for a career in the U.S. Foreign Service, other government agencies, or international commerce.

This program of study is offered by the Latin American Studies Program.

For policies governing all minors, see the Academic Policies chapter of this catalog.

**Course Work**

Students pursuing this minor must complete 18 credits of coursework with a minimum GPA of 2.0.

**One course (3 credits) chosen from:**

- HIST 271 - Survey of Latin American History Credits: 3
- HIST 272 - Survey of Latin American History Credits: 3
- GOVT 331 - Government and Politics of Latin America Credits: 3

**Five elective courses (15 credits)**

Students may satisfy the electives with any course that contains a significant emphasis on Latin America or the culture, politics, sociology, or history of Latinos living in the United States. Students choose electives from courses offered by at least three different departments in consultation with the program director. Upper-level Latin American literature or culture courses taught in Spanish or Portuguese may be used to satisfy the this requirement.

**Language proficiency**

Students minoring in Latin American studies must demonstrate reading, speaking, or writing knowledge of Spanish or Portuguese by exam or by achieving a minimum grade of 2.00 in a 300-level course in the language selected. Upper-level Latin American literature or culture courses taught in Spanish or Portuguese may be used to satisfy the electives requirement.

**Total: 18 credits**
Minors and Interdisciplinary Minors in Humanities and Social Sciences

The College of Humanities and Social Sciences has 59 minors, some of which are offered jointly with other units in the university. Minors require between 15 and 21 credits, and all but 8 of those credits can be used simultaneously to fill other requirements. The college encourages all students to declare a minor, if they can. A minor can complement the major, enhance career preparation, allow students to develop a secondary area of expertise, or give them a chance to explore a passion.

The college offers two types of minors: disciplinary and interdisciplinary. The coursework for disciplinary minors comes mainly from a single discipline. Disciplinary minors are offered by one of the 10 departments in the college.

Interdisciplinary minors require coursework from two or more disciplines and are administered by interdepartmental faculty groups, often including faculty from across the university.

All minors in the college are available to students in any major in the university. For more information, see All about Minors.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Disciplinary minors:

- Arabic Minor
- Anthropology
- American Government
- Art History
- Childhood Studies
- Chinese
- Communication
- Consciousness and Transformation
- Criminology, Law and Society
- Economic Systems Design
- Economics
- Electronic Journalism
- English
- French
- German
- History
- International/Comparative Studies
- Latin
- Neuroscience Minor
- Philosophy
- Psychology
- Public Policy and Management
- Religious Studies
- Russian
- Sociology
- Spanish
- Writing and Rhetoric Minor
Interdisciplinary minors:

- African and African American Studies
- Ancient Mediterranean Art and Archaeology
- Applied Conservation Studies (offered jointly with the College of Science)
- Asia-Pacific Studies
- Classical Studies
- Entrepreneurship Studies
- Film and Media Studies
- Folklore and Mythology
- Global Affairs
- Global Systems
- Immigration Studies
- Islamic Studies
- Japanese Studies
- Judaic Studies
- Latin American Studies
- Leadership
- Legal Studies
- Linguistics
- Middle East Studies
- Multimedia
- Native American and Indigenous Studies
- New Europe
- Nonprofit Studies
- Philosophy and Law
- Political Philosophy
- Science and Society
- Sport and American Culture (offered jointly with the School of Recreation, Health, and Tourism)
- Sport Communication (offered jointly with the School of Recreation, Health, and Tourism)
- Sustainability (offered jointly with the College of Science)
- Teaching English as a Second Language
- Urban and Suburban Studies
- Women and Gender Studies

Undergraduate Interdisciplinary Minor

Entrepreneurship Studies Minor

Banner Code: ENTS

Faculty: Buffardi, Kelly, Petrik, Rogers, Wagner

Entrepreneurship includes not only the familiar definition aligned with business management—growth-oriented, innovative practice associated with creative, sometimes aggressive management—but also definitions involving social change. Entrepreneurs guided by the latter definition are change agents who seize opportunities others miss in order to improve systems,
invent and disseminate new approaches, and advance sustainable solutions. The ultimate goal of these social entrepreneurs is the creation of social value and long-term transformation.

Social entrepreneurs are not content just to give a fish or teach how to fish. They will not rest until they have revolutionized the fishing industry. They set out, in short, to change the world or, at least, a small corner of it. A minor in entrepreneurship studies provides a student with both a liberal arts background in entrepreneurship—its sources of creativity and ethical foundations—as well as the skills to implement change.

The program is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Coursework

Students pursuing this minor must complete 16 credits of coursework with a minimum GPA of 2.00.

One required introductory course (1 credit)

- CHSS 310 - Introduction to Entrepreneurship Credits: 1
  Should be taken early on in the minor.

Two required core courses (6 credits)

- MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise Credits: 3
- PSYC 335 - Psychology of Creativity and Innovation Credits: 3

One elective course (3 credits) in social responsibility and ethics chosen from:

- PHIL 305 - Business Ethics Credits: 3
- NCLC 375 - Special Topics Credits: 1-18 This course may be applied to the requirements when the topic is ethics and leadership.

One elective course (3 credits) chosen from:

Other courses may be used to fulfill this requirement with the prior written approval of the director.

- COMM 320 - Business and Professional Communication Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
- EVPP 480 - Sustainability in Action Credits: 4
- GOVT 358 - Nonprofit Financial Planning Credits: 4
• NCLC 375 - Special Topics Credits: 1-18 This course may be applied to the requirements when the topic is principles of transformative action.
• PSYC 333 - Industrial and Organizational Psychology Credits: 3
• PSYC 435 - Personnel Training and Development: A Psychological Perspective Credits: 3
• PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3

One internship (3 credits)

Students register for an existing internship course, usually in their major, with the plan of work for the internship approved by the director of the minor.

Students who are currently employed may request that the internship requirement be waived on the basis of their job experience. They will be required to complete instead a 3-credit independent study with the director or another faculty member in which they conduct independent research, apply entrepreneurship principles and practices in an analysis of their work place, and produce a final project.

Total: 16 credits

Modern and Classical Languages

Phone: 703-993-1220
Web: mcl.gmu.edu

Faculty

Professors: Berroa, Gilbert, Ricouart, Winkler

Associate professors: Carreño-Rodríguez, Christensen (chair), Leeman, Levine, Rabin, Roman-Mendoza, Zhang

Assistant professors: Beck, Husseinali, Markx, Olson, Pichichero, Rogers, So, Vivancos-Perez

Term assistant professors: De Souza, Dudnik, Fujiwara, Haney, Mircea-Pines, Quintana, Salawdeh, Sweet, Vasilyeva, Vikis

Term instructors: Chen, Mulholland

Course Work

This department offers all course work designated ARAB, CHIN, CLAS, FREN, FRLN, GERM, GREE, HEBR, ITAL, JAPA, KORE, LATN, PERS, PORT, RUSS, SPAN, and TURK in the Courses chapter of this catalog.

Some courses are offered in English. Knowledge of a foreign language is not required.

General Education College-Level Requirements

The department offers a number of courses approved to fulfill university general education requirements. See General Education and College Requirements.
Language courses through the intermediate (200) level can be used to fulfill the college-level requirement in foreign languages for the bachelor of arts degree in the College of Humanities and Social Sciences and the College of Science. Other courses fulfill the college-level requirement in non-Western culture. See General Education and College Requirements.

**Undergraduate Programs**

The department offers a BA in foreign languages with concentrations in French, Spanish, and Chinese.

The concentration in French is designed for students who want to increase their proficiency in French language and culture while learning about the history, politics, and economics of the many French-speaking countries around the world. Students can take a study abroad course or spend a summer in Paris or Quebec, earning credit towards their degree. They can participate in the many French-speaking activities sponsored by Mason's French Club.

The concentration in Spanish enables students to become proficient in speaking, reading, and writing Spanish while learning about Latin American, Latino and Spanish languages practices, literatures, histories, and cultures. Students are encouraged to do an internship or service learning project, where they can draw on their knowledge of Spanish and gain valuable work experience while working for social change in their communities. Students have many opportunities to study Spanish abroad for as little as a week and as long as a semester and at the same time, earn credit toward their degree.

The concentration in Chinese enables students to become proficient in listening, speaking, reading, and writing Chinese while learning about Chinese literature, history, traditions, and culture. Students in this program are encouraged to study abroad or to do an internship. Students in Chinese are also encouraged to complete a double major.

All concentrations prepare students for teaching careers at the secondary school level, graduate study in languages, and research and professional work in government and private enterprise.

Faculty in the department participate in the interdisciplinary BA in Russian and Eurasian studies and the BA in Latin American studies.

**Foreign Languages with a Second Major**

Majors in foreign language are encouraged to complete a second major in another field. Students who want to pursue a second undergraduate major should plan a program of study in consultation with advisors from both degrees and be familiar with the relevant policies on more than one major. See the Academic Policies chapter of the catalog.

**Comparative Literature Emphasis**

The Department of Modern and Classical Languages participates in the BA in English with an emphasis in comparative literature. This program combines the study of literature in English with the study of one or more foreign literatures and with cross-cultural literary study. See the BA in English section of the catalog.

**Minors**

Language majors are encouraged to complete a minor in another field.

The department offers minors in Arabic, Classical Studies, Japanese Studies, Chinese, French, German, Latin, Russian, and Spanish. They are available to students in any major at Mason. Except for Classical Studies, all the minors have as a prerequisite the completion of 250 (or equivalent) in the relevant language. See the Minors and Interdisciplinary Minors section of this chapter.
Graduate Programs

The department offers a distinctive interdisciplinary master's degree in foreign languages designed to meet the needs and interests of prospective and practicing teachers and other professionals. It also prepares students for doctoral study at other institutions. Within the master's degree, students choose one of four concentrations: French, Spanish, French and Spanish, and Spanish/bilingual-multicultural education.

Funding

The department has a limited number of teaching assistantships for highly qualified graduate students with excellent language preparation. Students develop valuable language teaching experience by working with faculty experts in language teaching pedagogy.

Undergraduate Degree

Foreign Languages, BA

Banner Code: LA-BA-FRLN

Web: mcl.gmu.edu

The BA in foreign languages prepares students for teaching careers at the secondary school level, graduate study in languages, and research and professional work in government and private enterprise.

Students who major in foreign languages are encouraged to complete a minor or, if possible, a second major in another field. Students who want a double major in foreign language and another subject should plan a program of study in consultation with advisors from both disciplines and follow the steps outlined in the Academic Policies chapter of the catalog.

This program of study is offered by the Department of Modern and Classical Languages.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in foreign languages must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences.

In addition, students must complete one concentration.

▲ Concentration in Chinese (CHIN)

As China continues to emerge from centuries of isolation, it is assuming a key role on the international scene—not only in business, politics and finance, but also in art, culture and science. This transformation directly involves one fifth of the world’s population and will have a profound impact, however indirectly, on the rest of humanity. China also will play a pivotal role in shaping the Earth’s environment. Chinese has been identified by the national security committee as one of the critical languages.
The concentration in Chinese prepares students for teaching careers at the secondary school level, graduate study in Chinese, and research and professional work in government and private enterprise. Language majors with Chinese concentration are encouraged to complete a minor or, if possible, a second major in another field.

Students pursuing the concentration in Chinese must complete a minimum of 30 credits in Chinese at the 300 level and above, each with a minimum grade of 2.00. Students are expected to complete a balanced program that includes courses in language, culture and civilization, and literature. Only two courses (6 hours) taught in English may be applied to the major. Students are highly encouraged to participate in study abroad.

**Eight core courses (24 credits)**

- CHIN 300 - Reading Skills Development Credits: 3
- CHIN 301 - Advanced Grammar and Syntax Credits: 3
- CHIN 305 - Chinese for the Business World Credits: 3
- CHIN 318 - Introduction to Classical Chinese Credits: 3
- CHIN 355 - Readings in Chinese Poetry and Poetics Credits: 3
- CHIN 365 - Readings in Chinese Fiction after Mao Credits: 3
- CHIN 480 - Fourth-Year Chinese I Credits: 3
- CHIN 481 - Fourth-Year Chinese II Credits: 3

**Two elective courses (6 credits) chosen from:**

With the approval of their advisor and the director, students may apply to this requirement relevant courses in anthropology (ANTH), art history (ARTH), government (GOVT), history (HIST), philosophy (PHIL), religious studies (RELI), and sociology (SOCI).

- CHIN 310 - Survey of Chinese Literature Credits: 3
- CHIN 311 - Modern Chinese Literature in Translation Credits: 3
- CHIN 320 - Contemporary Chinese Film Credits: 3
- CHIN 325 - Major Chinese Writers Credits: 3
- CHIN 328 - Asian American Women Writers Credits: 3
- CHIN 470 - Special Topics in Chinese Studies Credits: 3
- CHIN 490 - Internship in Chinese Studies Credits: 1-9

Total: 30 credits

**Concentration in French (FRN)**

Students pursuing the concentration in French must complete a minimum of 33 credits in French at the 300 level and above, each with a minimum grade of 2.00. No more than one course (3 credits) conducted in English may be used to fulfill requirements for the concentration. Students are expected to complete a balanced program that includes courses in language, culture and civilization, and literature.
One advanced language course (6 credits)

- FREN 309 - Reading and Writing Skills Development Credits: 6

Two courses (6 credits) in literature and civilization chosen from:

- FREN 340 - Francophone Identities Credits: 3
- FREN 370 - French Civilization, Culture, and Literature: Ancient Gaul to 1789 Credits: 3
- FREN 371 - French Civilization, Culture, and Literature: 1789 to the Present Credits: 3

Three courses (9 credits) in FREN at the 300-level or above

Four courses (12 credits) in FREN at the 400-level or above

Total: 33 credits

▲ Concentration in Spanish (SPN)

Students pursuing the concentration in Spanish must complete a minimum of 33 credits in Spanish courses at the 300-level and above, each with a minimum grade of 2.00. With approval of the department, one course taught in English (3 credits) may be applied toward the concentration.

One or two core courses (6 credits):

- SPAN 305 - Spanish in Context I Credits: 3 and
- SPAN 306 - Spanish in Context II Credits: 3
  or
- SPAN 309 - Intensive Spanish in Context Credits: 6
  or
- SPAN 315 - Spanish for Heritage Speakers Credits: 3 and
- One additional course in Spanish (3 credits)

Three additional required courses (9 credits)
- SPAN 370 - Spanish Writing and Stylistics Credits: 3
- SPAN 385 - Introduction to Spanish Linguistics Credits: 3
- SPAN 390 - Introduction to Hispanic Literary Analysis Credits: 3

Four courses in Spanish at the 400 level (12 credits)

Two elective courses in Spanish (6 credits)

Choose from Spanish courses not specifically required or not used to fulfill another requirement.

Total: 33 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in foreign language may fulfill this requirement by successfully completing CHIN 480, FREN 309, or SPAN 370.

Undergraduate Interdisciplinary Minor

Classical Studies Minor

Banner Code: CLA

Web: classicalstudies.gmu.edu

The minor in Classical studies is designed for students who wish to become familiar with Classical cultures and broaden their knowledge of the foundations of Western civilization. It is especially relevant to students who are studying other areas of the humanities such as English, languages, comparative literature, history, art history, philosophy, or religious studies. The requirements of the minor provide flexibility so students can choose courses that are relevant to their primary interests.

This program of study is an interdisciplinary minor offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits with a minimum grade of 2.00.

Two courses (6 credits) in Classics
One required course

- CLAS 250 - Classical Mythology Credits: 3

One elective course chosen from:

- CLAS 260 - The Legacy of Greece and Rome Credits: 3
- CLAS 340 - Greek and Roman Epic Credits: 3
- CLAS 350 - Greek and Roman Tragedy Credits: 3
- CLAS 360 - Greek and Roman Comedy Credits: 3
- CLAS 370 - Greek and Roman Historians Credits: 3
- CLAS 380 - Greek and Roman Novels Credits: 3
- CLAS 390 - Topics in Classical Literature and Culture Credits: 3

One course (3 credits) in Classical history chosen from:

- HIST 301 - Classical Greece Credits: 3
- HIST 302 - Classical Rome Credits: 3
- HIST 388 - Topics in European History Credits: 3 (when the topic deals with antiquity)
- HIST 480 - Alexander the Great Credits: 3

One course (3 credits) in Classical art history or Classical philosophy

Choose from the following:

- ARTH 321 - Greek Art and Archaeology Credits: 3
- ARTH 322 - Roman Art and Archaeology Credits: 3
- ARTH 333 - Early Christian and Byzantine Art Credits: 3
- ARTH 399 - Special Topics in the History of Art Credits: 3 (when the topic is relevant to Classical art history)
- ARTH 420 - Advanced Studies in Ancient Art Credits: 3
- PHIL 301 - History of Western Philosophy: Ancient Credits: 3

Two elective courses (6 credits)

Electives may be chosen from any of the courses above not used to fulfill another requirement for the minor.

Total: 18 credits
Japanese Studies Minor

Banner Code: JPNS

Web: japanesestudies.gmu.edu

The minor in Japanese Studies enables students to advance their Japanese language skills and develop a sound understanding of Japanese culture and history from a global perspective. Students may focus their course work on language or on history and culture.

Students who wish to declare a minor in Japanese studies need to obtain the signature of the director.

This program of study is offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 6 courses (18 credits) with a minimum grade of 2.00. Special topics courses, when relevant, may be applied to the minor with prior written approval of the director.

Focus on language

Four courses (12 credits) in Japanese language

- JAPA 330 - Advanced Reading and Speaking I Credits: 3
- JAPA 331 - Advanced Reading and Speaking II Credits: 3
- JAPA 440 - Integrated Study of Japanese Language and Society I Credits: 3
- JAPA 441 - Integrated Study of Japanese Language and Society II Credits: 3

One course (3 credits) of Japanese and Japan-related history chosen from:

- HIST 251 - Survey of East Asian History Credits: 3
- HIST 252 - Survey of East Asian History Credits: 3
- HIST 356 - Modern Japan Credits: 3
- HIST 357 - Postwar Japan Credits: 3
- ARTH 385 - Arts of Japan Credits: 3

One elective course (3 credits) chosen from:

- JAPA 310 - Japanese Culture in a Global World Credits: 3
- JAPA 320 - Japanese Cinema Credits: 3
• ARTH 482 - Advanced Studies in Asian Art Credits: 3
• CHIN 328 - Asian American Women Writers Credits: 3
• GOVT 333 - Government and Politics of Asia Credits: 3
• GOVT 433 - Political Economy of East Asia Credits: 3
• RELI 212 - Religions of Asia Credits: 3
• RELI 315 - Buddhism Credits: 3

Total: 18 credits

Focus on history and culture

Two courses (6 credits) in Japanese language chosen from:

• JAPA 330 - Advanced Reading and Speaking I Credits: 3
• JAPA 331 - Advanced Reading and Speaking II Credits: 3
• JAPA 440 - Integrated Study of Japanese Language and Society I Credits: 3
• JAPA 441 - Integrated Study of Japanese Language and Society II Credits: 3

Two courses (6 credits) in Japanese and Japan-related history chosen from:

• HIST 251 - Survey of East Asian History Credits: 3
• HIST 252 - Survey of East Asian History Credits: 3
• HIST 356 - Modern Japan Credits: 3
• HIST 357 - Postwar Japan Credits: 3
• ARTH 385 - Arts of Japan Credits: 3

Two elective courses (6 credits) chosen from:

• ARTH 482 - Advanced Studies in Asian Art Credits: 3
• CHIN 328 - Asian American Women Writers Credits: 3
• GOVT 333 - Government and Politics of Asia Credits: 3
• GOVT 433 - Political Economy of East Asia Credits: 3
• JAPA 310 - Japanese Culture in a Global World Credits: 3
• JAPA 320 - Japanese Cinema Credits: 3
• RELI 212 - Religions of Asia Credits: 3
• RELI 315 - Buddhism Credits: 3
Undergraduate Minor

Arabic Minor

Banner Code: ARBC

The minor in Arabic has an emphasis on developing strong language skills: oral communication and the reading of texts. Students are also introduced to important works of Arabic literature and culture. A minor in Arabic can easily and effectively be combined with majors in other disciplines. It is especially valuable in combination with global affairs, international relations, security, journalism, philosophy, and religion.

This program of study is offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits beyond the intermediate proficiency level with a minimum grade of 2.00 in each course.

Three required courses (9 credits) chosen from:

- ARAB 330 - Reading and Conversation I Credits: 3
- ARAB 331 - Reading and Conversation II Credits: 3
- ARAB 350 - Media Arabic I (Written Media) Credits: 3
- ARAB 351 - Media Arabic II (Spoken Media) Credits: 3
- ARAB 390 - Translation Methods: Arabic to English Credits: 3

One 400-level language course (3 credits) chosen from:

- ARAB 420 - Survey of Arabic Literature Credits: 3
- ARAB 430 - Advanced Arabic Grammar Credits: 3
- ARAB 440 - Topics in Arabic Religious Thought and Texts Credits: 3

One additional ARAB course (3 credits)
Students chose any 300 or 400-level course taught in Arabic.

One course (3 credits) offered in English chosen from:

- ARAB 325 - Major Arab Writers/Stories Credits: 3
- ARTH 320 - Art of the Islamic World Credits: 3
- GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
- GOVT 345 - Political Islam Credits: 3
- HIST 461 - Arab-Israeli Conflict Credits: 3
- HIST 462 - Women in Islamic Society Credits: 3
- HIST 465 - The Middle East in the 20th Century Credits: 3
- RELI 374 - Islamic Thought Credits: 3
- RELI 375 - Qur'an and Hadith Credits: 3

Total: 18 credits

Chinese Minor

Banner Code: CHIN

Web: chinese.gmu.edu

The minor in Chinese is offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits beyond CHIN 250 (or equivalent) with a minimum grade of 2.00 in each course.

Three courses (9 credits) in language chosen from:

- CHIN 300 - Reading Skills Development Credits: 3
- CHIN 301 - Advanced Grammar and Syntax Credits: 3
- CHIN 305 - Chinese for the Business World Credits: 3
- CHIN 480 - Fourth-Year Chinese I Credits: 3
- CHIN 481 - Fourth-Year Chinese II Credits: 3

One course (3 credits) in literature taught in Chinese chosen from:
• CHIN 318 - Introduction to Classical Chinese Credits: 3
• CHIN 355 - Readings in Chinese Poetry and Poetics Credits: 3
• CHIN 365 - Readings in Chinese Fiction after Mao Credits: 3

Two courses (6 credits) chosen from either of the two groups above or from the courses below:

No more than one course taught in English may be applied to the minor.

• CHIN 310 - Survey of Chinese Literature Credits: 3
• CHIN 311 - Modern Chinese Literature in Translation Credits: 3
• CHIN 320 - Contemporary Chinese Film Credits: 3
• CHIN 470 - Special Topics in Chinese Studies Credits: 3
• ARTH 384 - Arts of China Credits: 3
• HIST 353 - History of Traditional China Credits: 3
• HIST 354 - Modern China Credits: 3
• HIST 358 - Post-1949 China Credits: 3
• RELI 314 - Chinese Philosophies and Religious Traditions Credits: 3

Total: 18 credits

French Minor

Banner Code: FRN

Web: french.gmu.edu

This program of study is offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits beyond FREN 250 (or equivalent) with a minimum grade of 2.00 in each course.

One advanced language course (6 credits)

• FREN 309 - Reading and Writing Skills Development Credits: 6
Two courses (6 credits) in literature and civilization chosen from:

- FREN 340 - Francophone Identities Credits: 3
- FREN 370 - French Civilization, Culture, and Literature: Ancient Gaul to 1789 Credits: 3
- FREN 371 - French Civilization, Culture, and Literature: 1789 to the Present Credits: 3

Two elective courses (6 credits) in FREN at the 300 level or above

FREN 325 and 329 cannot be used to fulfill this requirement. Students choose electives in consultation with an advisor. These courses must be conducted in French.

Total: 18 credits

German Minor

Banner Code: GRM

Web: german.gmu.edu

The emphasis of the minor in German is on developing strong language skills: oral communication and the reading of texts. Students are introduced to important works of German literature and to the culture of German-speaking countries.

A German minor can easily and effectively be combined with majors in other disciplines. It is especially valuable in combination with business, computer science, international studies, history, music, philosophy, or another language.

This program of study is offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits beyond GERM 250 (or equivalent) with a minimum grade of 2.00 in each course. A maximum of one course (3 credits) conducted in English can be applied to the minor.

Three language courses (9 credits) chosen from:

- GERM 310 - Conversation and Composition Credits: 3
- GERM 316 - German for the Business World Credits: 3
- GERM 318 - Translation of Texts Credits: 3
- GERM 415 - Advanced Grammar and Style Credits: 3
- GERM 418 - Advanced Composition Credits: 3
One genre or survey course (3 credits) chosen from:

- GERM 301 - Culture and Civilization Credits: 3
- GERM 325 - Major Writers Credits: 3
- GERM 340 - Survey of German Literature Credits: 3
- GERM 355 - Readings in Poetry Credits: 3
- GERM 365 - Readings in Narrative Prose Credits: 3
- GERM 375 - Readings in Drama Credits: 3

One period course (3 credits) chosen from:

- GERM 442 - The Age of Goethe Credits: 3
- GERM 444 - The Literature of Romanticism Credits: 3
- GERM 450 - Modern Literature: 1880-1925 Credits: 3
- GERM 451 - Modern Literature: 1925 to the Present Credits: 3
- GERM 480 - Special Topics Credits: 3

One German elective course (3 credits) at the 300 level or above

Total: 18 credits

Latin Minor

Banner Code: LATN

Web: latin.gmu.edu

The minor in Latin offers students the opportunity to develop and refine their knowledge of the Latin language by reading classical Latin literature. Students gain an understanding and appreciation of the literature, culture, and intellectual achievements of Roman antiquity that have contributed to the development of Western civilization.

A Latin minor complements majors in literature, language, history, philosophy, and the arts, all of which find their roots in classical antiquity. Majors in the natural and the social sciences are also strengthened by the historical perspective and the advanced training in language and terminology afforded by the minor in Latin.

This program of study is offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of this catalog.
Course Work

Students pursuing this minor must complete 18 credits in Latin beyond the intermediate proficiency level with a minimum grade of 2.00 in each course.

Six courses (18 credits)

These courses vary in content and may be repeated for credit when content is different.

- LATN 351 - Roman Prose Literature Credits: 3
- LATN 352 - Roman Poetry Credits: 3
- LATN 451 - Studies in Roman Literature Credits: 3
- LATN 452 - Studies in Roman Literature Credits: 3

Total: 18 credits

Russian Minor

Banner Code: RUS

Web: russian.gmu.edu

This program of study is offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of the catalog.

Course Work

Students pursuing this minor must complete 18 credits beyond RUSS 250 (or equivalent) with a minimum grade of 2.00 in each course.

Three courses (9 credits) in language chosen from:

- RUSS 302 - Russian Conversation and Composition or RUSS 303 - Russian Advanced Conversation Credits: 3
- RUSS 380 - Advanced Russian I Credits: 3
- RUSS 381 - Advanced Russian II Credits: 3

One course (3 credits) in literature chosen from:

- RUSS 310 - Readings in Russian Literature Credits: 3
• RUSS 311 - Contemporary Russian Short Fiction Credits: 3

One course (3 credits) chosen from:

• RUSS 353 - Russian Civilization Credits: 3
• RUSS 354 - Contemporary Post-Soviet Life Credits: 3

One elective course (3 credits) at the 300 level or above

This course must be conducted in Russian.

Total: 18 credits

Spanish Minor

Banner Code: SPN
Web: spanish.gmu.edu

This program of study is offered by the Department of Modern and Classical Languages.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits beyond SPAN 250 (or equivalent) with a minimum grade of 2.00 in each course.

One or two courses (6 credits) in language:

• SPAN 305 - Spanish in Context I Credits: 3 and SPAN 306 - Spanish in Context II Credits: 3
  or
• SPAN 309 - Intensive Spanish in Context Credits: 6
  or
• SPAN 315 - Spanish for Heritage Speakers Credits: 3 and one elective course in Spanish Credits: 3

Two courses (6 credits)

One course (3 credits) in stylistics
• SPAN 370 - Spanish Writing and Stylistics Credits: 3

One course chosen from:

• SPAN 385 - Introduction to Spanish Linguistics Credits: 3
• SPAN 388 - Introduction to Latina/o Studies Credits: 3
• SPAN 390 - Introduction to Hispanic Literary Analysis Credits: 3

Two Spanish elective courses (6 credits) at the 300 or 400 level

These courses must be conducted in Spanish.

Total: 18 credits

Master's Degree

Foreign Languages, MA

Banner Code: LA-MA-FRLN

Web: mcl.gmu.edu

This program meets the needs and interests of prospective and practicing teachers and other professionals, and prepares students for doctoral study at other institutions. The program offers four concentrations: French, Spanish, French and Spanish, and Spanish/bilingual-multicultural education.

This program of study is offered by the Department of Modern and Classical Languages.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in foreign languages, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

Students who elect a concentration in one language must complete a program of 30 credits. Those who concentrate in two languages must complete a program of 42 credits. The concentration in Spanish/bilingual-multicultural education requires 36
credits. In all four concentrations, 6 of the total credits may be earned with a thesis. Regardless of the concentration selected, all students must meet the core and distribution requirements given below and pass a comprehensive exam or write a thesis.

▲ Concentration in French (FRN)

Students pursuing this concentration must complete 30 credits, with at least 18 credits earned in courses with the subject code FREN.

Two required courses in literature (6 credits)

Courses should be chosen in consultation with an advisor and cover two different literary periods or Francophone regions.

Two required courses in French language and linguistics (6 credits)

Courses should be chosen in consultation with an advisor.

Two required courses in French (6 credits)

Students choose two additional courses in French literature or language in consultation with an advisor.

Four elective courses (12 credits)

Students should choose electives in consultation with an advisor. A maximum of 6 credits may be used for directed reading and research or thesis.

- FREN 798 - Directed Reading and Thesis Research Credits: 3
- FREN 799 - Thesis Credits: 1-3

Total: 30 credits

▲ Concentration in Spanish (SPN)

Two required core courses (6 credits)

Students must take the core courses within their first 15 credits.

- SPAN 502 - Hispanic Sociolinguistics Credits: 3
- SPAN 510 - Introduction to the Graduate Study of Literature in Spanish Credits: 3

Three required courses (9 credits) in Spanish language and literature

- One course (3 credits) in the literature of Spain
• One course (3 credits) in the literature of Spanish America
• One course (3 credits) in Spanish language or Spanish linguistics

Five elective courses (15 credits)

Students choose electives in consultation with an advisor. They can include additional courses in Spanish language and literature, courses with the subject code FRLN, up to 6 credits of courses in related fields, and up to 6 credits of thesis. Students intending to go on for the PhD in linguistics or literature are strongly encouraged to pursue the thesis option. Independent studies courses are not available for graduate students of Spanish.

• SPAN 798 - Directed Reading and Research Credits: 3
• SPAN 799 - Thesis Credits: 1-6

Total: 30 credits

▲ Concentration in Spanish and French (SF)

Six courses in French (18 credits)

Students take the required courses (not electives) specified under the concentration in French.

Six courses in Spanish (18 credits)

Students take the required courses (not electives) specified under the concentration in Spanish, plus one elective in SPAN.

Two elective courses (6 credits)

Electives may include directed reading and research or thesis. Students who elect to complete a thesis may apply 6 credits of 798 and 799 to fulfill this requirement.

• FREN 798 - Directed Reading and Thesis Research Credits: 3
• SPAN 798 - Directed Reading and Research Credits: 3
• FREN 799 - Thesis Credits: 1-3
• SPAN 799 - Thesis Credits: 1-6

Total: 42 credits

▲ Concentration in Spanish/Bilingual-Multicultural Education (SBM)
Two required courses in Spanish (6 credits)

Students must take the core courses within their first 15 credits.

- SPAN 502 - Hispanic Sociolinguistics Credits: 3
- SPAN 510 - Introduction to the Graduate Study of Literature in Spanish Credits: 3

Four graduate courses in Spanish (12 credits)

- One course (3 credits) in the literature of Spain
- One course (3 credits) in the literature of Spanish America
- One course (3 credits) in Spanish language or Spanish linguistics
- One graduate course (3 credits) in a research field chosen by the student

Two bilingual education seminars (6 credits) chosen from:

- EDCI 516 - Bilingualism and Language Acquisition Research Credits: 3
- EDCI 519 - Methods of Teaching Multilingual Students Credits: 3
- EDCI 520 - Assessment of Language Learners Credits: 3
- EDCI 521 - Curriculum Development for Language Learners Credits: 3

Four elective courses (12 credits)

Students choose electives in consultation with an advisor. Electives may include directed reading and research or thesis. Students who elect to complete a thesis may apply 6 credits of 798 and 799 to fulfill this requirement.

- SPAN 798 - Directed Reading and Research Credits: 3
- SPAN 799 - Thesis Credits: 1-6

Total: 36 credits

■ New Century College

Phone: 703-993-1436
Web: ncc.gmu.edu

Faculty

Professor: O’Connor

Associate professors: Gabel, Garner, Gring-Pemble, Lucas (associate dean), Muir, Smith, Wood, Wingfield
Assistant professors: Chen, Freeman, Gilmore, Gorski, Mahatmya, Owen

Term assistant professors: Dunne, Fuertes, Scott, Vitazkova, Wagner

Adjunct faculty: Carter, Holder, Johnson, Kohr, Lynch, Saddler, Scott, Smith, Sweetman, Tillman, Uy-Tioco

Administration

Nance Lucas, Associate Dean
Kelly Dunne, Assistant Dean, Academic Affairs
Lisa Gring-Pemble, Assistant Dean, Faculty Development
Wendy Wagner, Director of the Center for Leadership and Community Engagement
Karen Misencik, Director of Experiential Learning
Teri Slick, Director of Student Services
Misty Hensley, Student Services Coordinator

Course Work

NCC offers all course work designated NCLC in the Courses chapter of this catalog.

About New Century College

An integral part of the College of Humanities and Social Sciences, New Century College (NCC) offers students a personalized, interdisciplinary education typical of a small liberal arts college within the context of a large public university. Drawing on its own faculty, which is enriched regularly with others from across the university, New Century provides a learning environment that integrates interdisciplinary knowledge with workplace and lifelong learning. The programs enhance students' technology skills, improve their writing, and provide them with challenging opportunities.

New Century College students interact closely with faculty; engage in critical thinking, problem solving, creative activity, and leadership development; and participate in experiential education in the form of internships, field studies, service learning, or study abroad. They learn to develop original ideas, engage in active and reflective learning, master competency areas, and conduct independent inquiry with high ethical standards. Both the structure and curriculum of New Century College respond to the needs of civic and corporate communities and provide instruction for a rapidly changing society.

Undergraduate Programs

New Century College offers a bachelor of arts and a bachelor of science degree in integrative studies. The curriculum is based on intensive, interdisciplinary learning communities, coordinated with traditional academic programs. The result is an integrated program of study that emphasizes collaboration, experiential learning, and self reflection.

All students complete their degree programs with an interdisciplinary concentration. See the programs of study below. Students develop mastery of eight essential competencies (communication, global understanding, group interaction, aesthetic awareness, critical thinking, civic engagement, digital literacy, and well-being) assessed through freshman and graduation portfolios.

Mason Cornerstones

New Century College offers an interdisciplinary first-year program known as Mason Cornerstones. Freshmen from many university majors may be invited to participate. Invitations are based on academic performance and other criteria. Cornerstones is a competitive 24-credit program that consists of a sequence of four courses:
NCLC 101 - Narratives of Identity
NCLC 102 - Global Networks and Communities
NCLC 103 - Human Creativity: Science and Art
NCLC 203 - Inquiry for Action: Facilitating Change

NCLC 101, 102, and 203 are writing-intensive courses that emphasize written communication as a way of thinking, discovering, and expressing ideas. Students who complete these three courses with a minimum GPA of 2.0 have fulfilled 3 credits of the general education requirement in written communication (equivalent to ENGH 101). Students who successfully complete all of Mason Cornerstones with a minimum GPA of 2.00 will have also met the university general education requirements in oral communication, information technology, literature, arts, non-laboratory natural science, global understanding, Western civilization, and social and behavioral science.

Transfer Students

New Century College welcomes transfer students from other four-year institutions or community colleges, as well as from other academic units within Mason. Academic advisors work with students to best use transfer credits and provide a plan for timely completion of the bachelor’s degree. All transfer students are required to take NCLC 391 within their first two semesters and meet with an academic advisor as soon as possible.

Minors

New Century College offers minors in childhood studies, consciousness and transformation, leadership studies, multimedia, nonprofit studies, and science and society. All are available to students in any major in the university. See the Minors and Interdisciplinary Minors section of this chapter.

The Sustainability Studies Minor is offered jointly by the Department of Environmental Science and Policy and New Century College. For details, see the Department of Environmental Science and Policy section of the College of Science chapter of this catalog.

Graduate Programs

The college sponsors the concentration in zoo and aquarium leadership in the master’s degree in interdisciplinary studies (MAIS). This concentration prepares students for advanced careers in modern, professional zoos and aquariums. Admission to the concentration and enrollment in the courses is restricted to members of the Association of Zoos and Aquariums.

See the Interdisciplinary Studies section of this chapter for details.

Centers

New Century College houses the Center for Consciousness Transformation, the Center for Field Studies, and the Center for Leadership and Community Engagement. The services of these centers are available to all students and faculty in the university.

Undergraduate Degree

Environmental and Sustainability Studies, BA

Banner Code: LA-BA-EVSS
Colleges: College of Humanities and Social Sciences and College of Science

Departments: ■ New Century College and ■ Environmental Science and Policy

The BA in environmental and sustainability studies is a joint program between two colleges and their departments (listed above).

This degree provides students with theoretical and practical knowledge of three aspects of environmental and sustainability studies: people, prosperity, and planet. In addition to required core courses, students develop more in-depth knowledge in one of four concentrations. This degree prepares students for employment and graduate study in fields related to social justice, business and public policy, and environmental protection as they relate to the environment and sustainability.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in environmental and sustainability studies must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 59 credits with a minimum grade of 2.00 in each course.

Of the credits required for this degree, two credits may simultaneously fulfill the experiential learning requirement and requirements of the concentration, 14 credits simultaneously fulfill core requirements for the major and general education requirements, and, depending on the concentration and electives chosen, up to 9 credits may simultaneously fulfill university general education requirements and college BA requirements. Thus, depending on the concentration, electives, and experiential learning, this degree requires between 34 and 43 unique credits.

Eleven required core courses (39 credits)

Core requirements fulfill university general education requirements in natural science (EVPP 110, 111) and the BA requirement for social and behavioral science (GOVT 361).

Three courses (11 credits) in environmental science and society

Fulfills the general education natural science requirement.

- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4
- EVPP 377 - Applied Ecology Credits: 3

Two courses (7 credits) in individual and group behavior

- EVPP 336 - Human Dimensions of the Environment Credits: 3
- NCLC 334 - Environmental Justice Credits: 4

Two courses (6 credits) in business and public policy chosen from:
• EVPP 322 - Business and Sustainability Credits: 3
  and one of the following:
• EVPP 361 - Introduction to Environmental Policy Credits: 3
  or
• GOVT 361 - Introduction to Environmental Policy Credits: 3

One course (4 credits) in statistics

• SOCI 313 - Statistics for the Behavioral Sciences Credits: 4

Three courses (11 credits) in integration, analysis, innovation

• NCLC 210 - Sustainable World Credits: 4
• EVPP 480 - Sustainability in Action Credits: 4
• NCLC 490 - Internship Credits: 1-6 (3 credits may be applied to this requirement.) Credits / Units: 3

Experiential learning (2 credits)

Students must complete 2 credits of experiential learning through NCC or EVPP courses offering experiential learning credit, an additional internship, field studies, or study abroad. These credits may simultaneously be applied to the credits required for a concentration.

One Concentration (18-19 credits)

Students must complete one concentration.

▲ Concentration in Climate Change and Society (CCSO)

The requirements for this concentration, depending on the electives chosen, may fulfill the BA requirement in philosophy and religious studies (PHIL 343).

Three required courses (9 credits)

• CLIM 101 - Global Warming: Weather, Climate, and Society Credits: 3
• EVPP 432 - Energy Policy Credits: 3
• EVPP 436 - The Human Dimensions of Global Climate Change Credits: 3
9 credits chosen from:

- EVPP 362 - Intermediate Environmental Policy Credits: 3
- GGS 302 - Global Environmental Hazards Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 309 - Meteorology and Climate Credits: 3
- GGS 312 - Physical Climatology Credits: 3
- GGS 314 - Severe and Extreme Weather Credits: 3
- GGS 322 - Issues in Global Change Credits: 3
- GGS 353 - Observations of the Earth and its Climate Credits: 3
- NCLC 220 - Energy and Environment Credits: 3-6
- NCLC 306 - Our Common Futures Credits: 3-6
- PHIL 343 - Topics in Environmental Philosophy Credits: 3

Total: 18 credits

▲ Concentration in Environmental Economics (EVEC)

The requirements for this concentrate fulfill the university general education requirement in social and behavioral science (ECON 103 or 104) and, depending on the electives chosen, may fulfill the BA requirement in non-Western culture (ECON 361 or 362).

Four required courses (12 credits)

Fulfills general education requirement in social and behavioral science.

- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3
- ECON 335 - Environmental Economics Credits: 3 ECON 306 is strongly recommended as a prerequisite to ECON 335.
- EVPP 362 - Intermediate Environmental Policy Credits: 3

6 credits chosen from:

- ECON 306 - Intermediate Microeconomics Credits: 3
- ECON 360 - Economics of Developing Areas Credits: 3
- ECON 361 - Economic Development of Latin America Credits: 3
- ECON 362 - African Economic Development Credits: 3
- EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- EVPP 338 - Ecological Economics Credits: 3
- GGS 305 - Economic Geography Credits: 3
• NCLC 306 - Our Common Futures Credits: 3-6

Total: 18 credits

▲ Concentration in Environmental Policy and Politics (EVPO)

The requirements for this concentration fulfill BA requirements in social and behavioral science (ECON 105) and, depending on the electives chosen, philosophy and religious studies (PHIL 343).

Four required courses (12 credits)

• ECON 105 - Environmental Economics for the Citizen Credits: 3
• EVPP 362 - Intermediate Environmental Policy Credits: 3
• GOVT 103 - Introduction to American Government Credits: 3
• GOVT 132 - Introduction to International Politics Credits: 3

6 credits chosen from:

• ECON 335 - Environmental Economics Credits: 3 ECON 306 is strongly recommended as a prerequisite to ECON 335.
• EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
• EVPP 338 - Ecological Economics Credits: 3
• EVPP 432 - Energy Policy Credits: 3
• GEOL 420 - Earth Science and Policy Credits: 3
• GGS 307 - Sustainable Development Credits: 3
• NCLC 220 - Energy and Environment Credits: 3-6
• NCLC 306 - Our Common Futures Credits: 3-6
• NCLC 331 - The Nonprofit Sector Credits: 4
• PHIL 343 - Topics in Environmental Philosophy Credits: 3

Total: 18 credits

▲ Concentration in Equity and Environmental Justice (EQEJ)

The requirements for this concentration fulfill the BA requirements in non Western culture (ANTH 114), social and behavioral science (ANTH 114), and philosophy and religious studies (PHIL 343).

Four required courses (13 credits)
- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
- EVPP 362 - Intermediate Environmental Policy Credits: 3
- PHIL 343 - Topics in Environmental Philosophy Credits: 3
- NCLC 304 - Social Movements and Community Activism Credits: 4

6 credits chosen from:

- ANTH 370 - Environment and Culture Credits: 3
- ECON 105 - Environmental Economics for the Citizen Credits: 3
- EVPP 335 - People, Plants, and Culture Credits: 3
- EVPP 436 - The Human Dimensions of Global Climate Change Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
  or
- GGS 307 - Sustainable Development Credits: 3
- GOVT 445 - Human Rights Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 306 - Our Common Futures Credits: 3-6
- NCLC 331 - The Nonprofit Sector Credits: 4
- SOCI 320 - Social Structure and Globalization Credits: 3
- SOCI 355 - Social Inequality Credits: 3

Total: 19 credits

Total: 59 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated as "writing intensive" in their major at the 300 level or above. Students majoring in environmental and sustainability studies should consult an advisor to learn how to fulfill this requirement.

Integrative Studies, BA

Banner Code: LA-BA-INTS

Web: ncc.gmu.edu

The bachelor of arts degree program in integrative studies is based on intensive, interdisciplinary learning communities coordinated with traditional academic programs. The result is an integrated program of study that emphasizes collaboration,
experiential learning, and self-reflection. The degree program requires mastery of eight essential competencies: communication, global understanding, group interaction, aesthetic awareness, critical thinking, civic engagement, digital literacy, and well-being. The competencies are assessed through freshman and graduation portfolios.

This program of study is offered by New Century College.

Students in this degree program who are admitted to Mason Cornerstones complete university general education as specified below. They must complete Cornerstones and the 24 credits of learning communities with a minimum GPA of 2.00 in order to be able to use them to fulfill general education requirements.

- Completion of Mason Cornerstones: lower-level written communication (ENGH 101), oral communication, information technology, arts, natural science (non laboratory), global understanding, social and behavioral sciences, literature, and Western civilization
- Completion of 24 credits of learning communities: upper-level written communication (ENGH 302), writing intensive course
- Completion of coursework specifically approved for these requirements (in NCC or in other units): quantitative reasoning, natural science (with laboratory)
- NCLC 491 - The Senior Capstone Experience

Students must fulfill all requirements for bachelor's degrees. Students who are not admitted to Mason Cornerstones need to complete the university general education requirements and additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students who transfer into New Century College should consult with an advisor on what they need to take to complete university general education requirements.

## Degree Requirements

### Learning communities (24 credits)

Learning communities are interdisciplinary courses that combine different subjects into a single course that is usually 3 or 6 credits. In learning communities, faculty and students explore various ways to understand a topic. Learning communities are structured to help promote a greater sense of identity with an academic community. Hallmarks of New Century College learning communities are team teaching, collaborative projects, emphasis on writing and critical thinking, and opportunity for independent study. They often include experiential learning, either as an integral part of the class or as an optional add on.

### Experiential learning (12-24 credits)

The requirement in experiential learning reflects New Century College’s commitment to provide educational experiences that prepare graduates for the workplace and the demands of active and responsible citizenship. The workplace is as viewed as a site of instruction, one where students are exposed to the variety of skills needed to succeed. Through experiential learning, students combine work experience with academic study so that each will enrich the other.

Experiential learning includes internships, study abroad, community service learning, course field trips, and other field study opportunities. The learning sites may change each semester and are usually off campus. George Mason provides student liability insurance for the experiential learning internship, but students are responsible for their own transportation and health care. Accident and health insurance is available from George Mason.

No more than 24 credits of experiential learning can count toward a student’s total credits for graduation.

### Graduation portfolio
The graduation portfolio is reviewed by New Century College faculty.

**Senior exposition (3 credits)**

Students complete their senior exposition through NCLC 491, which they must take the semester prior to graduation.

- NCLC 491 - The Senior Capstone Experience Credits: 3

**Electives (0-15 credits)**

If students take courses that fulfill more than one degree requirement (e.g. learning communities, experiential learning, concentration, or general education), they may need to take additional electives to reach the total of 120 credits required for a BA degree.

**Concentration (30-57 credits)**

A concentration is the equivalent of a major in a traditional degree program. Students choose from an established interdisciplinary concentration below or create with faculty an individualized program of study to fit their interests and needs. The coursework for the concentration consists of traditional courses, learning communities, independent study and experiential learning. Where applicable, courses applied to a concentration can also be used to fulfill the credits required in learning communities or experiential learning. Students must present a minimum GPA of 2.00 in courses applied to the concentration.

The bachelor's degree in integrative studies offers the concentrations in the following:

- advertising
- child and family studies
- conservation studies
- early childhood education
- elementary education
- international studies
- language arts for education
- legal studies
- organizational administration
- social justice
- social science for education
- individualized concentration

▲ Advertising (ADV)

Students complete the following course work:

**Eleven required courses (37 credits)**

- ACCT 203 - Survey of Accounting Credits: 3
- COMM 230 - Case Studies in Persuasion Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
• MKTG 301 - Principles of Marketing Credits: 3
• MKTG 312 - Consumer Behavior Credits: 3
• MKTG 313 - Integrated Marketing Communications Credits: 3
• MSOM 301 - Managing People and Organizations or MGMT 301 - People and Organizations Credits: 3
• MSOM 302 - Managing Information in a Global Environment Credits: 3
• NCLC 202 - Public Speaking and Critical Thinking Skills Credits: 4
• NCLC 249 - Digital Literacy Credits: 4
• NCLC 345 - Introduction to Multimedia Credits: 5

One course (3-6 credits) chosen from:

• NCLC 331 - The Nonprofit Sector Credits: 4
• NCLC 420 - Work Effectiveness Skills Credits: 3
• NCLC 423 - Management in the Global Marketplace Credits: 6
• NCLC 431 - Principles of Fund Raising Credits: 4
• NCLC 445 - Multimedia Design Credits: 5
• NCLC 449 - Multimedia Research and Project Development Credits: 4

Two courses (6-10 credits) chosen from:

• ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
• AVT 104 - Studio Fundamentals I Credits: 4
• AVT 180 - New Media in the Creative Arts Credits: 3
• AVT 280 - Introduction to New Media Arts Credits: 4
• BULE 302 - Legal Environment of Business Credits: 3
• COMM 157 - Video Workshop Credits: 1
• COMM 375 - Mass Communication Advertising and Promotions Credits: 3
• COMM 430 - Persuasion Credits: 3
• FNAN 301 - Financial Management Credits: 3
• GOVT 358 - Nonprofit Financial Planning Credits: 4
• MIS 301 - Introduction to Business Information Systems Credits: 3
• MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise Credits: 3
• MSOM 305 - Managing in a Global Economy Credits: 3
• NCLC 195 - Field-Based Work Credits: 1-6
• WMST 100 - Representations of Women Credits: 3
• WMST 304 - Women and Media Credits: 3
• SPMT 412 - Sport Marketing and Finance Credits: 3

Total: 46-53 credits
Child and Family Studies (CFS)

Students complete the following course work:

Eight required courses (26-30 credits)

- NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-6
- NCLC 316 - Introduction to Childhood Studies Credits: 4
- NCLC 317 - Issues in Family Relationships Credits: 4
- PSYC 100 - Basic Concepts in Psychology Credits: 3
- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 313 - Child Psychology Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3 or SOCI 313 - Statistics for the Behavioral Sciences Credits: 4
- PSYC 415 - Psychological Factors in Aging Credits: 3 or SOCW 435 - Introduction to Gerontology Credits: 3 or SOCI 441 - The Sociology of Aging

Two courses (6-12 credits) chosen from:

- ANTH 302 - Peoples and Cultures of Latin America Credits: 3
- ANTH 301 - Native North Americans Credits: 3
- ANTH 304 - Peoples and Cultures of the Pacific Credits: 3
- ANTH 306 - Peoples and Cultures of Island Asia Credits: 3
- ANTH 311 - Peoples and Cultures of Mainland Southeast Asia Credits: 3
- ANTH 330 - Peoples and Cultures of Selected Regions: Non-Western Credits: 3
- CONF 101 - Conflict and Our World Credits: 3
- HEAL 325 - Health Aspects of Human Sexuality Credits: 3
- HEAL 327 - Women's Health Credits: 3
- HEAL 330 - Nutrition Credits: 3
- HEAL 350 - Interventions for Populations and Communities at Risk Credits: 3
- NCLC 231 - Introduction to Community Studies Credits: 4
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 310 - Violence and Gender Credits: 3-6
- NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-6
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
- NCLC 331 - The Nonprofit Sector Credits: 4
- NCLC 379 - Cancer and Its Social Impact Credits: 4
- PSYC 314 - Adolescent Psychology Credits: 3
- PSYC 324 - Personality Theory Credits: 3
- PSYC 325 - Abnormal Psychology Credits: 3
- PSYC 330 - Psychology of Adjustment Credits: 3
- PSYC 362 - Psychology of Women Credits: 3
- SOCW 415 - Child and Family Welfare Credits: 3
- SOCW 423 - Social Work with Children and Adolescents Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 315 - Women and Men in Society Credits: 3

Total: 32-42 credits

▲ Conservation Studies (CNST)

Three to five core courses (15-16 credits) in conservation studies

Students may complete this requirement through regular coursework or through the Smithsonian-Mason Semester Program.

Regular Coursework

- NCLC 211 - Introduction to Conservation Studies Credits: 3-6 (take 6 credits)
- NCLC 401 - Conservation Biology Credits: 6
- EVPP 336 - Human Dimensions of the Environment Credits: 3

Smithsonian-Mason Semester Program

Students complete 16 credits offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian Conservation Biology Institute. In this integrated series of courses, taken together in one semester, students live on site at the institute in Front Royal, VA. Students who apply this coursework to the concentration cannot also apply it to the minor in Applied Conservation Studies.

- CONS 320 - Conservation in Practice Credits: 3
- CONS 401 - Conservation Theory Credits: 3
- CONS 402 - Applied Conservation Credits: 4
- CONS 410 - Human Dimensions in Conservation Credits: 3
- CONS 490 - Integrated Conservation Strategies Credits: 3

Three courses (11 credits) on the environment

- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4
- EVPP 361 - Introduction to Environmental Policy Credits: 3

Two courses (8-12 credits) chosen from:
In addition to the courses below, NCLC 375, 395, and 398 may be applied to the concentration when the topic is relevant to conservation studies.

- NCLC 220 - Energy and Environment Credits: 3-6 (take 6 credits)
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 307 - Narratives of Nature Credits: 6
- NCLC 308 - American Landscapes in Fiction, Film, and History Credits: 6
- NCLC 311 - The Mysteries of Migration: Consequences for Conservation Credits: 6
- NCLC 331 - The Nonprofit Sector Credits: 4
- NCLC 334 - Environmental Justice Credits: 4

Total: 34-39 credits

▲ Early Childhood Education (ECED)

- 9 credits of ENGH or COMM
- 9 credits of natural science (must include a lab science)
- 9 credits of MATH or STAT
- 3 credits of world history
- 3 credits of U.S. history
- 3 credits of ECON
- 3 credits of GGS
- 3 credits of arts or music
- 3 credits of humanities

Total: 45 credits

▲ Elementary Education (ELED)

- 12 credits of ENGH or COMM course work
- 12 credits of natural science
- 12 credits of mathematics or statistics
- 3 credits of ECON course work
- 3 credits of U.S. history
- 3 credits of GGS course work
- 3 credits of civics course work (met by GOVT or HIST course)
- 3 credits of humanities course work
- 3 credits of world history course work (met by HIST 100 or 125)
- 3 credits of Fine Arts

Total: 57 credits
▲ International Studies (INST)

Students complete the following course work:

Language proficiency

All students must demonstrate language proficiency at the intermediate level through coursework (a Mason course numbered 210) or proficiency testing.

One course in religious studies (3 credits) chosen from:

- RELI 100 - The Human Religious Experience Credits: 3
- RELI 211 - Religions of the West Credits: 3
- RELI 212 - Religions of Asia Credits: 3

One course in geography (3 credits) chosen from:

- GGS 101 - Major World Regions Credits: 3
- GGS 103 - Human Geography Credits: 3
- GGS 301 - Political Geography Credits: 3

One course in world history (3 or 6 credits) chosen from:

- NCLC 201 - The World Since 1945 Credits: 6
- HIST 125 - Introduction to World History Credits: 3
- HIST 130 - History of the Modern Global System Credits: 3
- ANTH 300 - Civilizations Credits: 3

One course in sustainability (4 or 6 credits) chosen from:

- NCLC 210 - Sustainable World Credits: 4
- NCLC 306 - Our Common Futures Credits: 3-6 (Students take 6 credits.)
- NCLC 334 - Environmental Justice Credits: 4

One course in politics (3 or 4 credits) chosen from:
• NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-6 (Students take 4 credits.)
• ANTH 312 - Political Anthropology Credits: 3
• GOVT 322 - International Relations Theory Credits: 3

One course in conflict transformation (3 or 6 credits) chosen from:

• NCLC 314 - Conflict, Trauma and Healing Credits: 6
• NCLC 315 - Spirituality and Conflict Transformation Credits: 6
• NCLC 381 - When Cultural Worlds Collide Credits: 6
• NCLC 416 - Refugee and Internal Displacement Credits: 3

One course (3 credits) in creative arts chosen from:

• ARAB 325 - Major Arab Writers/Stories Credits: 3
• ARTH 320 - Art of the Islamic World Credits: 3
• ARTH 380 - African Art Credits: 3
• ARTH 382 - Arts of India Credits: 3
• ARTH 383 - Arts of Southeast Asia Credits: 3
• ARTH 384 - Arts of China Credits: 3
• ARTH 385 - Arts of Japan Credits: 3
• ARTH 386 - The Silk Road Credits: 3
• CHIN 325 - Major Chinese Writers Credits: 3
• DANC 118 - World Dance Credits: 3
• DANC 318 - Global Perspectives: World Dance Forms Credits: 3
• ENGH 362 - Global Voices Credits: 3
• ENGH 366 - The Idea of a World Literature Credits: 3
• ENGH 367 - World Literatures in English Credits: 3
• FREN 325 - Major French Writers Credits: 3
• FRLN 330 - Topics in World Literature Credits: 3
• GERM 325 - Major Writers Credits: 3
• MUSI 103 - Musics of the World Credits: 3
• NCLC 446 - Art, Beauty, and Culture Credits: 3-6 (Students take 3 credits.)
• RUSS 325 - Major Russian Writers Credits: 3
• THR 359 - World Stages Credits: 3
• SPAN 325 - Major Hispanic Writers Credits: 3

Three elective courses (9-12 credits)

Students take three additional courses focused on an international area of their interest with the advice and approval of an adviser.

Total: 31-43 credits
Language Arts for Education (LAED)

Students complete the following:

- NCLC 202 - Public Speaking and Critical Thinking Skills Credits: 4
- NCLC 307 - Narratives of Nature Credits: 6
- LING 306 - General Linguistics Credits: 3
- LING 522 - Modern English Grammar Credits: 3
- ENGH 308 - Introduction to Literary Theory Credits: 3 or ENGH 408 - Topics in Criticism Credits: 3 or ENGH 409 - Literary Modes Credits: 3
- ENGH 362 - Global Voices Credits: 3 or ENGH 366 - The Idea of a World Literature Credits: 3 or ENGH 367 - World Literatures in English Credits: 3
- ENGH 382 - Writing Nonfiction Genres Credits: 3 or ENGH 396 - Introduction to Creative Writing Credits: 3 or ENGH 388 - Professional and Technical Writing Credits: 3 or ENGH 486 - Writing Nonfiction for Publication

One course chosen from:

- ENGH 322 - Shakespeare Credits: 3
- ENGH 323 - Shakespeare Credits: 3
- ENGH 320 - Literature of the Middle Ages Credits: 3
- ENGH 321 - English Poetry and Prose of the 16th Century Credits: 3
- ENGH 325 - English Poetry and Prose of the 17th Century Credits: 3
- ENGH 330 - Augustan Age: 1660-1745 Credits: 3
- ENGH 334 - British Poetry of the Romantic Period Credits: 3
- ENGH 335 - Prose and Poetry of the Victorian Period Credits: 3
- ENGH 431 - Topics: British Literary Periods Credits: 3
- ENGH 421 - Medieval Literature in Context Credits: 3
- ENGH 324 - English Renaissance Drama Credits: 3
- ENGH 332 - Restoration and 18th Century Drama Credits: 3
- ENGH 339 - British and Irish Drama after 1900 Credits: 3
- ENGH 333 - British Novel of the 18th Century Credits: 3
- ENGH 336 - British Novel of the 19th Century Credits: 3
- ENGH 338 - British Novel after 1900 Credits: 3

One course chosen from:

- ENGH 315 - Folklore and Folklife Credits: 3
- ENGH 348 - Beginnings of African American Literature Through 1865 Credits: 3
- ENGH 350 - African American Literature Through 1946 Credits: 3
- ENGH 351 - Contemporary African American Literature Credits: 3
- ENGH 355 - Recent American Fiction Credits: 3
- ENGH 340 - Early American Literature Credits: 3
- ENGH 341 - Literature of the American Renaissance Credits: 3
- ENGH 442 - Topics: American Literary Periods Credits: 3
• ENGH 345 - American Drama of the 20th Century Credits: 3
• ENGH 343 - Development of the American Novel to 1914 Credits: 3
• ENGH 344 - Development of the American Novel since 1914 Credits: 3

Three elective courses (9 credits) in English

Courses used to fulfill this requirement cannot be applied to any of the other requirements for this concentration.

Total: 40 credits

▲ Legal Studies (LGLS)

Complete the following:

• NCLC 202 - Public Speaking and Critical Thinking Skills Credits: 4
• GOVT 103 - Introduction to American Government Credits: 3
• PHIL 173 - Logic and Critical Thinking Credits: 3
• COMM 260 - Basic Debate Theory and Practice Credits: 3
• GOVT 301 - Public Law and the Judicial Process Credits: 3
• PHIL 311 - Philosophy of Law Credits: 3
• BULE 302 - Legal Environment of Business Credits: 3

One course chosen from:

• GOVT 422 - Constitutional Interpretation Credits: 3
• GOVT 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
• GOVT 424 - Constitutional Law: Criminal Process and Rights Credits: 3

Four courses chosen from:

• Any undergraduate CRIM course
• Any CONF course
• COMM 100 - Public Speaking Credits: 3
• COMM 230 - Case Studies in Persuasion Credits: 3
• COMM 430 - Persuasion Credits: 3
• COMM 475 - Journalism Law Credits: 3
• ECON 103 - Contemporary Microeconomic Principles Credits: 3
• ECON 104 - Contemporary Macroeconomic Principles Credits: 3
• ECON 310 - Money and Banking Credits: 3
• ECON 335 - Environmental Economics Credits: 3
- ECON 390 - International Economics Credits: 3
- ECON 415 - Law and Economics Credits: 3
- GOVT 307 - Legislative Behavior Credits: 3
- GOVT 420 - American Political Thought Credits: 3
- GOVT 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
- GOVT 446 - International Law and Organization Credits: 3
- GOVT 452 - Administrative Law and Procedures Credits: 3
- NCLC 204 - Leadership Theory and Practice Credits: 3
- NCLC 304 - Social Movements and Community Activism Credits: 4
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 335 - Ethics, Communication, and Freedom Credits: 3-6
- NCLC 420 - Work Effectiveness Skills Credits: 3
- PHIL 309 - Bioethics Credits: 3
- SOCI 301 - Criminology Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 471 - Prevention and Deterrence of Crime Credits: 3

Total: 37-45 credits

▲ Organizational Administration (OADM)

Complete the following:

- NCLC 202 - Public Speaking and Critical Thinking Skills Credits: 4 or COMM 320 - Business and Professional Communication Credits: 3 or COMM 335 - Organizational Communication Credits: 3
- PSYC 231 - Social Psychology Credits: 3 or SOCI 304 - The Future of Work Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 6 or NCLC 420 - Work Effectiveness Skills Credits: 3
- MSOM 302 - Managing Information in a Global Environment Credits: 3 or MIS 301 - Introduction to Business Information Systems Credits: 3 or NCLC 348 - Digital Futures Credits: 6
- MSOM 303 - Marketing in a Global Economy Credits: 3 or MKTG 301 - Principles of Marketing Credits: 3 or NCLC 423 - Management in the Global Marketplace Credits: 6
- MSOM 300 - Managing Financial Resources Credits: 3 or FNAN 301 - Financial Management Credits: 3 or NCLC 431 - Principles of Fund Raising Credits: 4
- MSOM 301 - Managing People and Organizations Credits: 3 or MGMT 301 - People and Organizations Credits: 3 or NCLC 331 - The Nonprofit Sector Credits: 4

Three courses chosen from:

- ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
- COMM 300 - Foundations of Public Communication Credits: 3
- FNAN 301 - Financial Management Credits: 3
- GOVT 103 - Introduction to American Government Credits: 3
- GOVT 300 - Research Methods and Analysis Credits: 4
- GOVT 308 - The American Presidency Credits: 3
- GOVT 318 - Interest Groups, Lobbying, and the Political Process Credits: 3
- GOVT 351 - Administration in the Political System Credits: 3
- GOVT 358 - Nonprofit Financial Planning Credits: 4
- HEAL 314 - Community Health Issues and Strategies Credits: 3
- HEAL 350 - Interventions for Populations and Communities at Risk Credits: 3
- HEAL 372 - Health Communication Credits: 3
- HEAL 430 - Seminar in Exercise Science and Health Promotion Credits: 3
- HEAL 450 - Epidemiology and Environmental Health Credits: 3
- HEAL 470 - Community Health Systems Credits: 3
- MIS 301 - Introduction to Business Information Systems Credits: 3
- NCLC 249 - Digital Literacy Credits: 4
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 310 - Violence and Gender Credits: 3-6
- NCLC 330 - Enterprise Development Credits: 6 (take 3 credits)
- NCLC 331 - The Nonprofit Sector Credits: 4
- NCLC 379 - Cancer and Its Social Impact Credits: 4
- NCLC 410 - Contemporary Health Issues Credits: 3-18 (take 6 credits)
- NCLC 420 - Work Effectiveness Skills Credits: 3
- NCLC 431 - Principles of Fund Raising Credits: 4
- NCLC 440 - Death, Dying, and Decision Making Credits: 3
- PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education Credits: 3
- PHIL 309 - Bioethics Credits: 3
- PRLS 310 - Program Planning and Design Credits: 3
- PSYC 231 - Social Psychology Credits: 3
- PSYC 324 - Personality Theory Credits: 3
- PSYC 418 - Death, Dying, and Grieving Credits: 3
- RELI 341 - Global Perspectives on Spirituality and Healing Credits: 3
- RELI 401 - Death and the Afterlife in World Religions Credits: 3
- SOCI 390 - Sociology of Health, Illness, and Disability Credits: 3
- SOCI 441 - The Sociology of Aging Credits: 3
- SOCW 351 - Social Policy and Social Justice Credits: 3
- TOUR 200 - Introduction to Travel and Tourism Credits: 3
- TOUR 312 - Ecotourism Credits: 3
- TOUR 330 - Resort Management Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3
- TOUR 352 - Heritage and Cultural Tourism Credits: 3
- TOUR 412 - Tourism and Events Marketing Credits: 3
- TOUR 440 - Meetings and Conventions Credits: 3

Total: 30-51 credits

▲Social Justice (SOCJ)

Students complete the following course work:
Core course (3 credits)

- NCLC 336 - Poverty, Wealth and Inequality in the US Credits: 3

Social construction of identity and oppression (minimum of 6 credits) chosen from:

- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
- NCLC 347 - Gender Representation in Popular Culture Credits: 3-6
- NCLC 416 - Refugee and Internal Displacement Credits: 3
- SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
- WMST 308 - Introduction to Lesbian, Gay, Bisexual, Transgender, Transsexual, and Queer Studies Credits: 3

Environmental and ecological justice (3-4 credits) chosen from:

- NCLC 334 - Environmental Justice Credits: 4
- NCLC 338 - Animal Rights and Animal Exploitation Credits: 3

Peace building and conflict transformation (6 credits) chosen from:

- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 315 - Spirituality and Conflict Transformation Credits: 6
- NCLC 316 - Introduction to Childhood Studies Credits: 4

Activism and social change (7-8 credits) chosen from:

- NCLC 304 - Social Movements and Community Activism Credits: 4
- NCLC 337 - Social Justice Consciousness and Personal Transformation Credits: 3
- NCLC 346 - Art as Social Action Credits: 4
- NCLC 436 - Social Justice Education Credits: 4

Elective courses (12 credits) chosen from:

- ANTH 370 - Environment and Culture Credits: 3
- **ANTH 488** - Gender, Sexuality, and Culture Credits: 3
- **CONF 302** - Culture, Identity, and Conflict Credits: 3
- **CONF 394** - Human Rights and Inequality Credits: 3
- **CRIM 308** - Human Rights and Justice Credits: 3
- **EVPP 436** - The Human Dimensions of Global Climate Change Credits: 3
- **FRLN 385** - Multilingualism, Identity, and Power Credits: 3
- **GOVT 445** - Human Rights Credits: 3
- **NCLC 210** - Sustainable World Credits: 4
- **NCLC 302** - Argument and Advocacy Credits: 6
- **NCLC 310** - Violence and Gender Credits: 3-6
- **NCLC 361** - Neighborhood, Community, and Identity Credits: 3-6
- **NCLC 401** - Conservation Biology Credits: 6
- **NCLC 435** - Leadership in a Changing Environment Credits: 4
- **SOCI 307** - Social Movements and Political Protest Credits: 3
- **SOCI 308** - Race and Ethnicity in a Changing World Credits: 3
- **SOCI 320** - Social Structure and Globalization Credits: 3
- **SOCI 355** - Social Inequality Credits: 3
- **WMST 200** - Introduction to Women and Gender Studies Credits: 3
- **WMST 308** - Introduction to Lesbian, Gay, Bisexual, Transgender, Transsexual, and Queer Studies Credits: 3

**Total: minimum 37 credits**

▲ **Social Science for Education (SSED)**

Complete the following:

- 6 credits of ECON courses
- **HIST 121** - Formation of the American Republic Credits: 3
- **HIST 322** - Modern Britain Credits: 3
- **HIST 125** - Introduction to World History Credits: 3 or **HIST 130** - History of the Modern Global System Credits: 3 or **NCLC 201** - The World Since 1945 Credits: 6
- **HIST 391** - History of Virginia to 1800 Credits: 3 or **HIST 392** - History of Virginia Since 1800 Credits: 3 or **HIST 122** - Development of Modern America Credits: 3

**6 credits chosen from:**

- any upper-level HIST course
- **NCLC 301** - Science in the News Credits: 3
- **NCLC 312** - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-6

**9 credits chosen from:**

- [ ]
• any GGS course  
• NCLC 340 - Progress: Can America Figure Out What It Means? Credits: 3-6  
• NCLC 341 - Progress: Washington, the New Edge City? Credits: 6  
• NCLC 360 - The Built Environment Credits: 6  

18 credits chosen from:  

• any GOVT course  
• NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-6  

Total: 51-54 credits  

▲ Individualized Concentration (IND)  
With approval of the assistant dean of academic affairs, students may construct an individualized concentration.  

Total: minimum 30 credits  

Integrative Studies, BS  

Banner Codes: LA-BS-INTS  
Web: ncc.gmu.edu  

The bachelor of science degree in integrative studies is based on intensive, interdisciplinary learning communities coordinated with traditional academic programs. The result is an integrated program of study that emphasizes collaboration, experiential learning, and self-reflection. The degree program requires mastery of eight essential competencies: communication, global understanding, group interaction, aesthetic awareness, critical thinking, civic engagement, digital literacy, and well-being. The competencies are assessed through freshman and graduation portfolios.  

This program of study is offered by New Century College.  

Students in this degree program who are admitted to Mason Cornerstones complete university general education as specified below. They must complete Cornerstones and the 24 credits of learning communities with a minimum GPA of 2.00 in order to be able to use them to fulfill general education requirements.  

• Completion of Mason Cornerstones: lower-level written communication (ENGH 101), oral communication, information technology, arts, natural science (non laboratory), global understanding, social and behavioral sciences, literature, and Western civilization  
• Completion of 24 credits of learning communities: upper-level written communication (ENGH 302), writing-intensive course
• Completion of coursework specifically approved for these requirements: quantitative reasoning, natural science (with laboratory)
• NCLC 491: synthesis

Students must fulfill all requirements for bachelor's degrees. Students who are not admitted to Mason Cornerstones need to complete the university general education requirements and additional college requirements for the BS degree in the College of Humanities and Social Sciences. Students who transfer into New Century College should consult with an advisor on what they need to take to complete university general education requirements.

Degree Requirements

Learning communities (24 credits)

Learning communities are interdisciplinary courses that combine subjects often taught in separate courses into a single course of 3-9 credits. In learning communities, faculty and students explore various ways to understand a topic. Learning communities are structured to help promote a greater sense of identity with an academic community. Hallmarks of New Century College learning communities are team teaching, collaborative projects, emphasis on writing and critical thinking, and opportunity for independent study. They often include experiential learning, either as an integral part of the class or as an optional add on.

Experiential learning (12 credits)

The requirement in experiential learning reflects New Century College’s commitment to provide educational experiences that prepare graduates for the workplace and the demands of active and responsible citizenship. The workplace is as viewed as a site of instruction, one where students are exposed to the variety of skills needed to succeed. Through experiential learning, students combine work experience with academic study so that each will enrich the other.

Experiential learning includes include internships, study abroad, community service learning, course field trips, and other field study opportunities. The learning sites may change each semester and are usually off campus. George Mason provides student liability insurance for the experiential learning internship, but students are responsible for their own transportation and health care. Accident and health insurance is available from George Mason.

No more than 24 credits of experiential learning can count toward a student’s total credits for graduation.

Senior exposition (3 credits)

Students complete their senior exposition through NCLC 491, which they must take the semester prior to graduation.

• NCLC 491 - The Senior Capstone Experience Credits: 3

Graduation portfolio

The graduation portfolio is reviewed by New Century College faculty.

Electives (0-15 credits)
If students take courses that fulfill more than one degree requirement (e.g. Learning Communities, Experiential Learning, Concentration, or General Education), they may need to take additional electives to reach the total of 120 credits required for a BS degree.

**Concentration (30-53 credits)**

A concentration is the equivalent of a major in a traditional degree program. Students choose from an established interdisciplinary concentration below or create with faculty an individualized program of study to fit their interests and needs. The coursework for the concentration consists of traditional courses, learning communities, independent study, and experiential learning. Where applicable, courses applied to a concentration can also be used to fulfill the credits required in learning communities or experiential learning. Students must present a minimum GPA of 2.00 in courses applied to the concentration.

▲ **Conservation Studies (CNST)**

**Three to five core courses (15-16 credits) in conservation studies**

Students may complete this requirement through regular coursework or through the Smithsonian-Mason Semester Program.

**Regular Coursework**

- NCLC 211 - Introduction to Conservation Studies Credits: 3-6 (take 6 credits)
- NCLC 401 - Conservation Biology Credits: 6
- EVPP 336 - Human Dimensions of the Environment Credits: 3

**Smithsonian-Mason Semester Program**

Students complete 16 credits offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian Conservation Biology Institute. In this integrated series of courses, taken together in one semester, students live on site at the institute in Front Royal, VA. Students who apply this coursework to the concentration cannot also apply it to the minor in Applied Conservation Studies.

- CONS 320 - Conservation in Practice Credits: 3
- CONS 401 - Conservation Theory Credits: 3
- CONS 402 - Applied Conservation Credits: 4
- CONS 410 - Human Dimensions in Conservation Credits: 3
- CONS 490 - Integrated Conservation Strategies Credits: 3

**Four courses (17-18 credits) in biology and ecology**

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5
- BIOL 311 - General Genetics Credits: 4 or BIOL 377 - Applied Ecology Credits: 3
One course in statistics (3-4 credits) chosen from:

- BIOL 312 - Biostatistics Credits: 4
- STAT 250 - Introductory Statistics I Credits: 3

Two additional courses (8-12 credits) chosen from:

In addition to the courses below, NCLC 375, 395, and 398 may be applied to the concentration when the topic is relevant to conservation studies.

- NCLC 220 - Energy and Environment Credits: 3-6 (take 6 credits)
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 307 - Narratives of Nature Credits: 6
- NCLC 308 - American Landscapes in Fiction, Film, and History Credits: 6
- NCLC 311 - The Mysteries of Migration: Consequences for Conservation Credits: 6
- NCLC 331 - The Nonprofit Sector Credits: 4
- NCLC 334 - Environmental Justice Credits: 4

Total: 43-50 credits

▲ Life Sciences (LIFS)

Students must complete one of the following emphases.

Preoccupational therapy emphasis:

- One SOCI course (3 credits)
- BIOL 124 - Human Anatomy and Physiology Credits: 4
- BIOL 125 - Human Anatomy and Physiology Credits: 4
- PHIL 151 - Introduction to Ethics Credits: 3 or PHIL 309 - Bioethics Credits: 3
- PSYC 100 - Basic Concepts in Psychology Credits: 3
- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 325 - Abnormal Psychology Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3

At least one course chosen from:
• NCLC 378 - Medicine, Justice, and Public Policy Credits: 3
• NCLC 379 - Cancer and Its Social Impact Credits: 4
• NCLC 410 - Contemporary Health Issues Credits: 3-18 (must take at least 4 credits)
• NCLC 440 - Death, Dying, and Decision Making Credits: 3

Emphasis Total: minimum 30 credits

Premedical emphasis:

• BIOL 213 - Cell Structure and Function Credits: 4
• an additional 6 credits of BIOL
• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CHEM 313 - Organic Chemistry Credits: 3 and CHEM 315 - Organic Chemistry Lab I Credits: 2
• CHEM 314 - Organic Chemistry Credits: 3 and CHEM 318 - Organic Chemistry Lab II Credits: 2
• MATH 110 - Introductory Probability Credits: 3 or MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 111 - Linear Mathematical Modeling Credits: 3 or MATH 114 - Analytic Geometry and Calculus II Credits: 4
• PHYS 243 - College Physics Credits: 3 and PHYS 244 - College Physics Lab Credits: 1
• PHYS 245 - College Physics Credits: 3 and PHYS 246 - College Physics Lab Credits: 1
• PHIL 151 - Introduction to Ethics Credits: 3 or PHIL 309 - Bioethics Credits: 3

Emphasis Total: 45-47 credits

Predental emphasis:

• BIOL 103 - Introductory Biology I Credits: 4
• BIOL 213 - Cell Structure and Function Credits: 4
• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CHEM 313 - Organic Chemistry Credits: 3
• CHEM 315 - Organic Chemistry Lab I Credits: 2
• CHEM 314 - Organic Chemistry Credits: 3
• CHEM 318 - Organic Chemistry Lab II Credits: 2
• CHEM 463 - General Biochemistry I Credits: 4
• CHEM 465 - Biochemistry Lab Credits: 2
• PHYS 103 - Physics and Everyday Phenomena I Credits: 4
  or PHYS 243 - College Physics Credit: 3 and PHYS 244 - College Physics Lab Credits: 1
• PHYS 104 - Physics and Everyday Phenomena II Credits: 4
  or PHYS 245 - College Physics Credits: 3 and PHYS 246 - College Physics Lab Credits: 1
• PHIL 151 - Introduction to Ethics Credits: 3 or PHIL 309 - Bioethics Credits: 3
Emphasis Total: 43 credits

Prepharmacy emphasis:

- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 213 - Cell Structure and Function Credits: 4
- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 318 - Organic Chemistry Lab II Credits: 2
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- PHIL 151 - Introduction to Ethics Credits: 3 or PHIL 309 - Bioethics Credits: 3
- PHYS 103 - Physics and Everyday Phenomena I Credits: 4
  or PHYS 243 - College Physics Credits: 3 and PHYS 244 - College Physics Lab Credits: 1
- PHYS 104 - Physics and Everyday Phenomena II Credits: 4
  or PHYS 245 - College Physics Credits: 3 and PHYS 246 - College Physics Lab Credits: 1
- STAT 250 - Introductory Statistics I Credits: 3

Emphasis Total: 48 credits

Prephysical therapy emphasis:

- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 124 - Human Anatomy and Physiology Credits: 4
- BIOL 125 - Human Anatomy and Physiology Credits: 4
- PSYC 100 - Basic Concepts in Psychology Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3
- CHEM 103 - Chemical Science in a Modern Society Credits: 4 or CHEM 211 - General Chemistry Credits: 4
- CHEM 104 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry Credits: 4 or
  CHEM 212 - General Chemistry Credits: 4
- PHIL 151 - Introduction to Ethics Credits: 3 or PHIL 309 - Bioethics Credits: 3
- PHYS 103 - Physics and Everyday Phenomena I Credits: 4
  or PHYS 243 - College Physics Credits: 3 and PHYS 244 - College Physics Lab Credits: 1
- PHYS 104 - Physics and Everyday Phenomena II Credits: 4
  or PHYS 245 - College Physics Credits: 3 and PHYS 246 - College Physics Lab Credits: 1
- PSYC 211 - Developmental Psychology Credits: 3 or PSYC 325 - Abnormal Psychology Credits: 3

Emphasis Total: 40 credits
Prephysician's assistant emphasis:

- BIOL 124 - Human Anatomy and Physiology Credits: 4
- BIOL 125 - Human Anatomy and Physiology Credits: 4
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 246 - Introductory Microbiology Credits: 3
- BIOL 313 - Human Genetics for the Social Sciences Credits: 3
- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 463 - General Biochemistry I Credits: 4
- CHEM 465 - Biochemistry Lab Credits: 2
- PSYC 100 - Basic Concepts in Psychology Credits: 3
- PSYC 211 - Developmental Psychology Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3
- PHIL 151 - Introduction to Ethics Credits: 3 or PHIL 309 - Bioethics Credits: 3

Emphasis Total: 49 credits

Total: 30-49 credits

▲ Natural Science for Education (NSED)

Required science courses (19 credits)

- any PHYS course (at least 3 credits)
- BIOL 103 - Introductory Biology I Credits: 4 or BIOL 104 - Introductory Biology II Credits: 4
- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- GEOL 101 - Introductory Geology I Credits: 4

One analytical reasoning course (3-4 credits) chosen from:
- MATH 106 - Quantitative Reasoning Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3

Six additional science courses (20-30 credits) chosen from:

- ASTR 111 - Introductory Astronomy: The Solar System Credits: 3 and ASTR 112 - Introductory Astronomy Lab: The Solar System Credits: 1
- ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3 and ASTR 114 - Introductory Astronomy Lab: Stars, Galaxies, and the Universe Credits: 1
- BIOL 124 - Human Anatomy and Physiology Credits: 4
- BIOL 125 - Human Anatomy and Physiology Credits: 4
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5
- CHEM 313 - Organic Chemistry Credits: 3 and CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 314 - Organic Chemistry Credits: 3 and CHEM 318 - Organic Chemistry Lab II Credits: 2
- CHEM 321 - Elementary Quantitative Analysis Credits: 4
- CHEM 331 - Physical Chemistry I Credits: 3 and CHEM 336 - Physical Chemistry Lab I Credits: 2
- CHEM 332 - Physical Chemistry II Credits: 3 and CHEM 337 - Physical Chemistry Lab II Credits: 2
- CHEM 341 - Fundamental Inorganic Chemistry Credits: 3
- GEOL 102 - Introductory Geology II Credits: 4
- GEOL 309 - Introduction to Oceanography Credits: 3
- GGS 102 - Physical Geography Credits: 3
- GGS 309 - Meteorology and Climate Credits: 3

Total: 42-53 credits

▲ Individualized Concentration (IND)

With approval of the assistant dean of academic affairs, students may construct an individualized concentration.

Total: 30 credits (minimum)

Undergraduate Interdisciplinary Minor
Applied Conservation Studies Minor

Banner Code: CONS

The minor in applied conservation studies is designed for undergraduate students who wish to augment their main academic program with conservation studies taught in an experiential manner. There are two tracks by which students can complete the minor: the Semester whose focus is on "Applied Conservation Strategies" or the Semester that focuses on "Ecology on Effective Conservation Practice". Both Semesters are grounded in natural science, and offer a collection of five interdisciplinary courses that combine public policy, sociology, conflict resolution, and global awareness with hands on experience. Students work with Mason faculty and researchers from the Smithsonian Conservation Biology Institute.

The minor is available only to students who enroll in either of the Smithsonian Mason Semesters, semester-long residential programs held at the Smithsonian Conservation Biology Institute in Front Royal, VA. The Semesters are offered jointly by New Century College in the College of Humanities and Social Sciences and the Department of Environmental Science and Policy in the College of Science under the auspices of the Mason Center for Conservation Studies.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete either of the tracks described below with a minimum grade of 2.00 in each course.

Applied Conservation Strategies track: Five required courses (16 credits)

- CONS 320 - Conservation in Practice Credits: 3
- CONS 401 - Conservation Theory Credits: 3
- CONS 402 - Applied Conservation Credits: 4
- CONS 410 - Human Dimensions in Conservation Credits: 3
- CONS 490 - Integrated Conservation Strategies Credits: 3

Ecology for Effective Conservation Practice track: Five required courses (16 credits)

- CONS 320 - Conservation in Practice Credits: 3
- CONS 403 - Ecology and Conservation Theory Credits: 3
- CONS 404 - Monitoring and Assessment of Biodiversity Credits: 4
- CONS 411 - Science Communication for Conservation Credits: 3
- CONS 491 - Comprehensive Conservation Planning Credits: 3

Total: 16 credits
Multimedia Minor

Banner Code: MM
Phone: 703-993-4318

Faculty

Chung, Higgins, Lont, Martin, O’Connor, L. Smith (director), Weinberger, White

In the multimedia minor, students learn how to create original work and communicate with others through the fusion of images, text, sound, and video. Students analyze and incorporate into their productions contemporary design principles and current software applications. As part of this process, students are encouraged to focus on how multimedia technologies, which offer new tools for investigating and disseminating ideas, can enhance undergraduate research and writing. These skills, now important in most academic disciplines, are also increasingly valuable not only in the specialized information technology industries, but also in business, education, and politics.

This minor is not available to students majoring in AVT with a concentration in digital arts.

This program of study is an interdisciplinary minor offered by New Century College.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete at least 18 credits of coursework with a minimum GPA of 2.00.

Core courses (8-9 credits):

Two courses (5 credits)

- AVT 104 - Studio Fundamentals I Credits: 4
- COMM 157 - Video Workshop Credits: 1 or NCLC 195 - Field-Based Work Credits: 1

One course (3-4 credits) chosen from:

- AVT 180 - New Media in the Creative Arts Credits: 3
- NCLC 249 - Digital Literacy Credits: 4

Elective courses (9-11 credits)
No more than six credits can be taken in any one college or department.

- AVT 280 - Introduction to New Media Arts Credits: 4
- AVT 382 - 2D Experimental Animation Credits: 4
- COMM 355 - Video Principles and Practices Credits: 3
- COMM 360 - Video Editing Credits: 3
- COMM 435 - Computers and Communication Credits: 3
- NCLC 345 - Introduction to Multimedia Credits: 5
- ENGH 376 - Rhetoric and New Media or NCLC 343 - Interactive Digital Texts Credits: 3
- ENGH 377 - Digital Creative Writing Credits: 3
- ENGH 497 - Topics in Creative Writing Credits: 3
- NCLC 348 - Digital Futures Credits: 3 or 6
- NCLC 349 - Writing for Multimedia Credits: 4
- NCLC 445 - Multimedia Design Credits: 5

Total: 18-20 credits

Science and Society Minor

Banner Code: SCSO

Web: scienceandsociety.gmu.edu

Phone: 703-993-9621

Faculty

Bitler, Dunne (director), Fox, Jacobsen, Kinnaman, McAuley, Rutledge, Rowan, Smith, Thompson

Through the course work in this minor students explore the effect of science in their daily lives and develop an understanding of the multiple ways that science is integrated into different, nonscience disciplines. As a prerequisite to the minor, students should have completed their general education science requirement of 7 to 8 credits.

Students start with NCLC 215, which provides them with a broad overview of related topics and helps them to develop their individualized core of courses. They end with a capstone NCLC 415, in which they demonstrate what they have learned through their course of study.

This program of study is an interdisciplinary minor offered by New Century College.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits of coursework with a minimum GPA of 2.00.

Two core courses in science and society (3 credits)
NCLC 215 - Introduction to Science and Society Credits: 2
NCLC 415 - Perspectives on Science and Society Credits: 1

Learning community (6-9 credits) chosen from:

- NCLC 210 - Sustainable World Credits: 4
- NCLC 211 - Introduction to Conservation Studies Credits: 3-6
- NCLC 220 - Energy and Environment Credits: 3-6
- NCLC 301 - Science in the News Credits: 3
- NCLC 307 - Narratives of Nature Credits: 6
- NCLC 311 - The Mysteries of Migration: Consequences for Conservation Credits: 6
- NCLC 318 - Exploring Virginia's Watersheds Credits: 4
- NCLC 334 - Environmental Justice Credits: 4
- NCLC 401 - Conservation Biology Credits: 6

Electives (6-9 credits)

Students choose electives during the core course NCLC 215 and in consultation with the director of the minor.

Total: 18 credits

Undergraduate Minor

Childhood Studies Minor

Banner Code: CHDS
Web: ncc.gmu.edu

Faculty

Dunne, Garner (director), Gorski, Mahatmya

The minor in childhood studies is designed for students who have a child-related focus in their major and for those who want to explore the topic of childhood. This minor focuses on the study of issues concerning children and their representations, including their experiences in society within historical and contemporary cultures and global contexts. The curriculum fosters thinking about childhood theory, research, policy -- and the practical applications of this knowledge to decisions regarding children and youth. The minor provides enough flexibility for students to choose relevant courses in keeping with their primary interests.
This program of study is offered by New Century College.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students must have a minimum grade of 2.00 in each of the courses applied to the minor.

Two core courses (at least 7 credits)

- NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-6
  Only 4 credits of NCLC 312 may be applied to the minor.
- NCLC 316 - Introduction to Childhood Studies Credits: 4

Three elective courses (9 credits) chosen from:

- ANTH 315 - Socialization Processes: Family, Childhood, Personality in Cross-Cultural Perspective Credits: 3
- CRIM 302 - Delinquency Credits: 3
- CRIM 406 - Family Law and the Justice System Credits: 3
- EDUC 302 - Human Growth and Development Credits: 3
- EDU 372 - Human Development, Learning, and Teaching Credits: 3
- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 313 - Child Psychology Credits: 3
- PSYC 314 - Adolescent Psychology Credits: 3
- PSYC 414 - Behavior Disorders of Childhood Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
- SOCI 360 - Youth Culture and Society Credits: 3
- SOCW 415 - Child and Family Welfare Credits: 3
- SOCW 423 - Social Work with Children and Adolescents Credits: 3

Total: 16 credits

Consciousness and Transformation Minor

Banner Code: CNTR

Web: ncc.gmu.edu

Faculty
Fuertes, Guenther, Lynch, Studd, Thurston (director)

The minor in consciousness and transformation provides students with a well-grounded understanding of the nature of human consciousness, including both the historical foundations and modern research findings. Through the required coursework, students develop an ability to implement personal practices that foster deeper self-awareness, the regulation of stress factors in his or her life, and an emerging sense of meaning for his or her life. Students will be learn to creatively and effectively apply principles from the exploration of consciousness and transformation to his or her own field of study.

This program of study is offered by New Century College.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students must have a minimum grade of 2.00 in each course applied to the minor.

Two core courses (6 credits)

- NCLC 355 - Consciousness, Meaning and Life Purpose Credits: 3
- NCLC 455 - Consciousness and Transformation in Action Credits: 3

Two to three electives courses (minimum 9 credits) chosen from:

- ANTH 400 - Engaging the World: Anthropological Perspectives Credits: 3
- AVT 204 - Visual Thinking Credits: 3
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- GCH 350 - Health Education Credits: 3
- MUSI 401 - Impact of the Arts on Civilization Credits: 3
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 315 - Spirituality and Conflict Transformation Credits: 6
- NCLC 346 - Art as Social Action Credits: 4
- NCLC 404 - Ethics and Leadership Credits: 4
- NCLC 435 - Leadership in a Changing Environment Credits: 4
- NCLC 446 - Art, Beauty, and Culture Credits: 3-6
- PHIL 378 - Reason, Science and Faith in the Modern Age Credits: 3
- PRLS 300 - People with Nature Credits: 3
- RELI 337 - Mysticism: East and West Credits: 3
- RELI 341 - Global Perspectives on Spirituality and Healing Credits: 3
- THR 395 - Theater as the Life of the Mind Credits: 3
- UNIV 442 - Krasnow Seminar Credits: 3

Total: 15 credits
Leadership Minor

Banner Code: LSHP

Web: ncc.gmu.edu

Faculty

Holder, Lucas, Owen (director), Wagner

The minor in leadership helps prepare students to lead effectively in the 21st century. It provides a broad understanding of leadership in contemporary society and emphasizes civic engagement. Through the required course work, students examine theories of leadership, analyze methods and styles of leadership, and participate in experiences to develop their own leadership skills. Students demonstrate what they have learned through community service-learning to Mason and the greater Washington, D.C., metropolitan area.

The minor in leadership may be pursued concurrently with any undergraduate major.

This program of study is offered by New Century College.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete a minimum of 15 credits of coursework with a minimum GPA of 2.0.

Three required core courses (11 credits)

- NCLC 204 - Leadership Theory and Practice Credits: 3
- NCLC 375 - Special Topics Credits: 1-18 (4 credits when topic is approved for the minor)
- NCLC 435 - Leadership in a Changing Environment Credits: 4

One course (at least 1 credit) of experiential learning

This requirement may be fulfilled through an approved internship, community service course, or other course work that includes experiential learning. This may include offerings under NCLC 195, 395, or UNIV 300. Students need prior written approval of the director of the minor to apply an experiential learning course to this requirement.

At least one elective course (3 to 4 credits) chosen from:

Other courses may be applied to the this requirement with prior written approval of the director.

- AVT 309 - Art as Social Action Credits: 3
- NCLC 346 - Art as Social Action Credits: 4
Nonprofit Studies Minor

Banner Code: NPS

Web: ncc.gmu.edu

Faculty

Benjamin, Sacco, Toepler, Wagner (director)

Nonprofit organizations significantly contribute to the provision of human services, access to the arts, education, recreation and health care, and protection of the environment. Effective nonprofit organizations provide direct services, influence public policy and build a civil society. The minor in nonprofit studies is designed to introduce students to the theoretical foundations and practical skills needed to be successful in this sector. Through heavy emphasis on experiential learning with the many excellent nonprofit organizations in our region, students learn to apply theory within the context of today's complex and rapidly changing environment.

This program of study is offered by New Century College.
For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 15 credits of coursework with a minimum GPA of 2.0

Three core courses (11-12 credits)

Two required core courses (8 credits)

These courses are approved by New Century College to earn experiential learning credits.

- NCLC 331 - The Nonprofit Sector Credits: 4
- NCLC 431 - Principles of Fund Raising Credits: 4

One additional course (3-4 credits) chosen from:

- COMM 389 - Public Relations for Associations and Nonprofits Credits: 3
- GOVT 358 - Nonprofit Financial Planning Credits: 4
- NCLC 435 - Leadership in a Changing Environment Credits: 4

Elective courses (3-4 credits) chosen from:

NCLC 304, 390, and 490 are approved by New Century College to earn experiential learning credits.

- AVT 370 - Entrepreneurship in the Arts Credits: 4
- COMM 335 - Organizational Communication Credits: 3
- COMM 389 - Public Relations for Associations and Nonprofits Credits: 3 (if not taken as required course)
- CONF 101 - Conflict and Our World Credits: 3
- CONF 300 - Conflict Resolution Techniques and Practice Credits: 3
- ECON 309 - Economic Problems and Public Policies Credits: 3
- GOVT 358 - Nonprofit Financial Planning Credits: 4
- MSOM 301 - Managing People and Organizations Credits: 3
- NCLC 210 - Sustainable World Credits: 4
- NCLC 211 - Introduction to Conservation Studies Credits: 3-6
- NCLC 304 - Social Movements and Community Activism Credits: 4
- NCLC 305 - Conflict Resolution and Transformation Credits: 6
- NCLC 340 - Progress: Can America Figure Out What It Means? Credits: 3-6
- NCLC 375 - Special Topics Credits: 1-18 (when the topic is relevant with prior written approval of the director)
- NCLC 390 - Internship Credits: 1-6 (when the topic is relevant with prior written approval of the director)
- NCLC 410 - Contemporary Health Issues Credits: 3-18
- NCLC 422 - An Experiential Approach to American Foreign Policy Credits: 3-6
- NCLC 435 - Leadership in a Changing Environment Credits: 4 (if not taken as required course)
- NCLC 490 - Internship Credits: 1-6 (when the topic is relevant with prior written approval of the director)
- PSYC 427 - Community Engagement for Social Change Credits: 3
- SOCI 492 - Sociology of Organizations Credits: 3
- SOCW 483 - Selected Approaches to Social Work Intervention Credits: 3
- TOUR 220 - Introduction to Event Management Credits: 3

Total: 15 credits

Philosophy

Phone: 703-993-1290
Web: philosophy.gmu.edu

Faculty

Professors: De Nys, Sagoff

Professors emeriti: Bergoffen, Fletcher, McDermott, Skousgaard

Associate professors: Cherubin, Eckenwiler, Froman, Holman, Kinnaman (chair), Light, Paden

Assistant professor: Angner, DiTeresim Jones

Term professor: Boyd

Adjunct professors: D. Gregory, Rogers, Sander, Sojka, Van Camp

Affiliate: Rothbart

Course Work

This department offers all course work designated PHIL in the Courses chapter of this catalog.

Undergraduate Programs

The department offers a bachelor's degree in philosophy, which covers the major issues and areas in philosophy. It is intended to serve the needs of students who wish to pursue graduate studies in philosophy or emphasize philosophy while acquiring a broad liberal arts education. Majors in philosophy take courses in a variety of philosophical traditions and study logic, ethics, and social and political philosophy. With the skills of critical thinking, skillful writing, and analytical reasoning that are the hallmark of philosophy majors, students are well-prepared for a wide range of careers including law, government service, or graduate study.

The philosophy program can complement other interests of students when they complete a second major in another field. Students who plan to pursue more than one undergraduate major should work out a program of study in consultation with advisors from both majors and be familiar with the relevant policies for completing more than one major. See the Academic Policies chapter of the catalog.
In addition to the general degree in philosophy, students can choose a concentration in philosophy and law. This concentration offers philosophy majors the opportunity to focus their study of philosophy in a way that prepares them for the study of the law.

**Honors in the Major**

Highly qualified students may apply to the honors program in the major. Students can apply in their second semester as a junior, before they have completed 90 credits and should have a minimum GPA of 3.50 in the major. Eligible students should submit a transcript, one letter of recommendation from a member of the philosophy faculty, and one writing sample, a paper from one of the student’s courses in philosophy.

Students pursuing honors in the major complete 6 credits of honors course work in either PHIL 422, 425, or 471. To graduate with honors in philosophy, students must complete these courses with a minimum GPA of 3.50.

**Minors**

The department offers a minor in philosophy and a minor in philosophy and law. These minors are available to students in any major. The department, in cooperation with the Department of Public and International Affairs, coordinates the interdisciplinary minor in political philosophy. See the Minors and Interdisciplinary Minors section of this chapter.

**Bachelor’s/Accelerated Master’s Program**

The department offers highly qualified undergraduate majors in philosophy the opportunity to apply to an accelerated master’s degree program in philosophy. If accepted, students will be able to earn both the undergraduate and graduate degrees after satisfactory completion of 144 credits, generally within five years.

**Graduate Programs**

The department offers a master’s degree in traditional and contemporary philosophy with specialized concentrations in philosophy and cultural theory, ethics and public affairs, and philosophy and public affairs. The degree is designed for students who want to further their professional goals or foster their intellectual development. It provides a solid preparation for advanced work in philosophy or other fields such as women and gender studies, cultural studies, or law. The degree provides grounding in the history of philosophy, ethics, metaphysics, epistemology, contemporary continental thought, contemporary analytic philosophy, and philosophy of science.

The focus on traditional and contemporary philosophy of the master's degree program provides students with a historical and pluralistic approach to philosophical questions. The concentration in ethics and public affairs gives students the opportunity to explore the ethical and philosophical issues that arise in such fields of study and work as business, health care, scientific research, biomedical technology, and public policy. The concentration in philosophy and cultural theory provides students with a distinctive and important theoretical foundation for doctoral work in cultural studies. The concentration in philosophy and public affairs allows students in the graduate program in philosophy at Moscow's Higher School of Economics to also earn a degree from George Mason.

Students are encouraged to pursue opportunities beyond the classroom such as study abroad, professional internships, and research with faculty members.

**Undergraduate Degree**

**Philosophy, BA**
The degree program in philosophy covers the major issues and areas in philosophy and serves the needs of students who wish to pursue graduate studies in philosophy or emphasize philosophy while acquiring a broad liberal arts education. Students can use this major as preparation for such professions as law or government service, or complement other interests by taking a double major in philosophy and a related field of study.

This program of study is offered by the Department of Philosophy.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in philosophy must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences.

Students pursuing this degree must complete at least 33 credits in philosophy earning a minimum grade of 2.00 in each course. At least 21 credits must be at the 300 level or above, including at least 6 credits at the 400 level or above. No course may be used to fulfill more than one requirement.

BA in Philosophy with no Concentration

One course (3 credits) in logic chosen from:

- PHIL 173 - Logic and Critical Thinking Credits: 3
- PHIL 376 - Symbolic Logic Credits: 3

Two courses (6 credits) in history of philosophy

- PHIL 301 - History of Western Philosophy: Ancient Credits: 3
- PHIL 303 - History of Western Philosophy: Modern Credits: 3

One course (3 credits) in the analytic tradition chosen from:

When the subject matter is appropriate and with the prior written approval of the undergraduate director, PHIL 391, 392, 421, 425, or 426 may be used to fulfill this requirement.

- PHIL 332 - Twentieth-Century Analytic Philosophy Credits: 3
- PHIL 371 - Philosophy of Natural Sciences Credits: 3
- PHIL 373 - Theory of Knowledge Credits: 3
• PHIL 374 - Philosophy of Mind Credits: 3

One course (3 credits) in the continental tradition chosen from:

When the subject matter is appropriate and with the prior written approval of the undergraduate director, PHIL 391, 392, 421, 425, or 426 may be used to fulfill this requirement.

• PHIL 335 - Nineteenth-Century Philosophy Credits: 3
• PHIL 336 - Twentieth-Century Continental Thought: Existentialism Credits: 3
• PHIL 337 - Twentieth-Century Continental Thought: Phenomenology Credits: 3
• PHIL 340 - Hermeneutic Philosophy Credits: 3

One course (3 credits) in ethics and social and political philosophy chosen from:

When the subject matter is appropriate and with the prior written approval of the undergraduate director, PHIL 391, 392, 421, 425, or 426 may be used to fulfill this requirement.

• PHIL 309 - Bioethics Credits: 3
• PHIL 311 - Philosophy of Law Credits: 3
• PHIL 323 - Classical Western Political Theory Credits: 3
• PHIL 324 - Modern Western Political Theory Credits: 3
• PHIL 325 - Karl Marx's Social and Political Thought Credits: 3
• PHIL 327 - Contemporary Western Political Theory Credits: 3
• PHIL 343 - Topics in Environmental Philosophy Credits: 3
• PHIL 355 - Theories of Ethics Credits: 3
• PHIL 470 - Seminar: Philosophical Examination of Social Issues and the Law Credits: 3

Five elective courses (15 credits) in philosophy

Students choose electives from any philosophy courses including those listed above that are not used to meet another requirement.

Total: 33 credits

▲ Concentration in Philosophy and Law (PH LW)

The concentration in philosophy and law offers philosophy majors the opportunity to focus their study of philosophy in a way that prepares them for the study of the law.

In addition to the specific courses listed below, other relevant courses may be applied to the requirements for this concentration with prior written approval of the undergraduate director.

One course (3 credits) in logic chosen from:
- PHIL 173 - Logic and Critical Thinking Credits: 3
- PHIL 376 - Symbolic Logic Credits: 3

Two core courses (6 credits) in history of philosophy

- PHIL 301 - History of Western Philosophy: Ancient Credits: 3
- PHIL 303 - History of Western Philosophy: Modern Credits: 3

One course (3 credits) in the analytic tradition chosen from:

When the subject matter is appropriate and with the prior written approval of the undergraduate director, PHIL 391, 392, 421, 425, or 426 may be used to fulfill this requirement.

- PHIL 332 - Twentieth-Century Analytic Philosophy Credits: 3
- PHIL 371 - Philosophy of Natural Sciences Credits: 3
- PHIL 373 - Theory of Knowledge Credits: 3
- PHIL 374 - Philosophy of Mind Credits: 3

One course (3 credits) in the continental tradition chosen from:

When the subject matter is appropriate and with the prior written approval of the undergraduate director, PHIL 391, 392, 421, 425, or 426 may be used to fulfill this requirement.

- PHIL 335 - Nineteenth-Century Philosophy Credits: 3
- PHIL 336 - Twentieth-Century Continental Thought: Existentialism Credits: 3
- PHIL 337 - Twentieth-Century Continental Thought: Phenomenology Credits: 3
- PHIL 340 - Hermeneutic Philosophy Credits: 3

One course (3 credits) in philosophy and law

- PHIL 311 - Philosophy of Law Credits: 3

Two courses (6 credits) chosen from:

- PHIL 323 - Classical Western Political Theory or GOVT 323 - Classical Western Political Theory Credits: 3
- PHIL 324 - Modern Western Political Theory or GOVT 324 - Modern Western Political Theory Credits: 3
• PHIL 327 - Contemporary Western Political Theory or GOVT 327 - Contemporary Western Political Theory Credits: 3
• GOVT 428 - Advanced Democratic Theory Credits: 3
• GOVT 448 - Ethics and International Politics Credits: 3
• PHIL 470 - Seminar: Philosophical Examination of Social Issues and the Law Credits: 3

Three elective courses in philosophy (9 credits)

Students choose electives from any philosophy courses including those listed above that are not used to meet another requirement.

Total: 33 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. All senior seminars in philosophy are writing intensive. Philosophy majors should consult the undergraduate director for other courses that can be taken to fulfill this requirement.

Undergraduate Interdisciplinary Minor

Political Philosophy Minor

Banner Code: PPHL

Phone: 703-993-1265

Faculty

Cherubin, De Nys, Harbour, Mandaville, Miller, Paden (director), Snyder-Hall

The minor provides students with an intensive study of political philosophy and political theory. Students take courses in the history of political philosophy; the moral evaluation of political institutions; the ethical, social, and political issues raised by globalization; and the conceptual foundations of democracy and human rights. Through this coursework, students are able to study this field from a variety of interdisciplinary perspectives. They develop a deeper philosophical perspective on political institutions and have a solid foundation for further graduate study in philosophy, government, or policy studies.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 15 credits of coursework with a minimum GPA of 2.00.
Two core courses (6 credits) chosen from:

- PHIL 323 or GOVT 323 - Classical Western Political Theory Credits: 3
- PHIL 324 or GOVT 324 - Modern Western Political Theory Credits: 3
- PHIL 327 or GOVT 327 - Contemporary Western Political Theory Credits: 3

Three elective courses (9 credits)

Students choose electives from the courses below or above (if not used to meet the core requirement). Special topics courses and independent studies courses, when relevant, may also be used to fulfill elective credits with prior written approval of the director.

- PHIL 427 or GOVT 427 - Feminist Political Thought Credits: 3
- PHIL 325 - Karl Marx's Social and Political Thought Credits: 3
- GOVT 328 - Non-Western Political Theory Credits: 3
- GOVT 329 - Issues in Political Theories and Values Credits: 1-3
- GOVT 420 - American Political Thought Credits: 3
- GOVT 421 - Contemporary Political Ideologies Credits: 3
- GOVT 428 - Advanced Democratic Theory Credits: 3
- GOVT 448 - Ethics and International Politics Credits: 3

Total: 15 credits

Undergraduate Minor

Philosophy and Law Minor

Banner Code: PHLW

Web: philosophy.gmu.edu

The minor in philosophy and law offers students a course of study that emphasizes the philosophical analysis of legal issues. It acquaints students with the rich tradition of philosophical argument dealing with the justification of law, its relation to moral theory, the justifications for punishment, and the concepts of justice, rights, liberty, and legal responsibility. In addition, an education in philosophy in general, and these courses in particular, stress intellectual skills that are important in the study of law.

This program of study is offered by the Department of Philosophy.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits of coursework with a minimum GPA of 2.0.
Four required courses (12 credits)

- PHIL 173 - Logic and Critical Thinking Credits: 3
- PHIL 301 - History of Western Philosophy: Ancient Credits: 3
- PHIL 303 - History of Western Philosophy: Modern Credits: 3
- PHIL 311 - Philosophy of Law Credits: 3

Two elective courses (6 credits)

One elective course may be chosen from other course work in philosophy with prior written approval of the undergraduate director.

Choose two from the following:

- PHIL 323 or GOVT 323 - Classical Western Political Theory Credits: 3
- PHIL 324 or GOVT 324 - Modern Western Political Theory Credits: 3
- PHIL 327 or GOVT 327 - Contemporary Western Political Theory Credits: 3
- GOVT 428 - Advanced Democratic Theory Credits: 3
- GOVT 448 - Ethics and International Politics Credits: 3
- PHIL 470 - Seminar: Philosophical Examination of Social Issues and the Law Credits: 3

Total: 18 credits

Philosophy Minor

Banner Code: PHIL

Web: philosophy.gmu.edu

Students can take a general minor or one organized around specific emphases, each of which stresses a different aspect of philosophy. The emphasis in the history of philosophy is particularly useful to students in the humanities, especially those who wish to pursue graduate study. The emphasis in reality, knowledge, and science is especially beneficial for students majoring in the human and natural sciences. The emphasis in social and political philosophy is recommended for students who plan to pursue a career in law or politics.

This program of study is offered by the Department of Philosophy.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits in philosophy with a minimum grade of 2.00 in each course. No course may be used to fulfill more than one requirement.
One course (3 credits) in logic chosen from:

- PHIL 173 - Logic and Critical Thinking Credits: 3
- PHIL 376 - Symbolic Logic Credits: 3

Two courses (6 credits) in history of philosophy:

- PHIL 301 - History of Western Philosophy: Ancient Credits: 3
- PHIL 303 - History of Western Philosophy: Modern Credits: 3

Three elective courses (9 credits) in philosophy

At least 6 of the elective credits must be at the 300 level or above. Students may choose to focus their three electives in one of the emphases below.

Emphasis in history of philosophy

One course (3 credits) in the history of philosophy chosen from:

- PHIL 302 - History of Western Philosophy: Medieval Credits: 3
- PHIL 325 - Karl Marx's Social and Political Thought Credits: 3
- PHIL 332 - Twentieth-Century Analytic Philosophy Credits: 3
- PHIL 335 - Nineteenth-Century Philosophy Credits: 3
- PHIL 336 - Twentieth-Century Continental Thought: Existentialism Credits: 3
- PHIL 337 - Twentieth-Century Continental Thought: Phenomenology Credits: 3

Two elective courses (6 credits) in philosophy

Emphasis in reality, knowledge, and science

Two courses (6 credits) chosen from:

- PHIL 312 - Philosophy of Technology Credits: 3
- PHIL 337 - Twentieth-Century Continental Thought: Phenomenology Credits: 3
- PHIL 340 - Hermeneutic Philosophy Credits: 3
- PHIL 357 - Philosophy of the Social Sciences Credits: 3
- PHIL 371 - Philosophy of Natural Sciences Credits: 3
- PHIL 373 - Theory of Knowledge Credits: 3
- PHIL 374 - Philosophy of Mind Credits: 3
- PHIL 375 - Metaphysics Credits: 3
- PHIL 377 - Darwin: Biology and Beyond Credits: 3
• PHIL 378 - Reason, Science and Faith in the Modern Age Credits: 3

One elective course (3 credits) in philosophy

Emphasis in social and political philosophy

Three courses (9 credits) chosen from:

• PHIL 311 - Philosophy of Law Credits: 3
• PHIL 312 - Philosophy of Technology Credits: 3
• PHIL 323 - Classical Western Political Theory Credits: 3
• PHIL 324 - Modern Western Political Theory Credits: 3
• PHIL 325 - Karl Marx's Social and Political Thought Credits: 3
• PHIL 327 - Contemporary Western Political Theory Credits: 3
• PHIL 338 - Woman: The Philosophical Questions Credits: 3
• PHIL 470 - Seminar: Philosophical Examination of Social Issues and the Law Credits: 3

Total: 18 credits

Bachelor's/Accelerated Master's Program

Philosophy, BA/Philosophy, Accelerated MA

Web: philosophy.gmu.edu

Highly qualified Mason philosophy majors may apply to the accelerated master’s degree. If accepted, students will be able to earn bachelor’s and master’s degrees in philosophy after satisfactory completion of 144 credits, sometimes within five years.

This program of study is offered by the Department of Philosophy.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in philosophy, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements
While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

**Master’s Degree**

**Philosophy, MA**

*Banner Code: LA-MA-PHIL*

*Web: philosophy.gmu.edu*

The master's degree in philosophy is designed for students who intend to pursue a doctorate in philosophy as well as for those who seek the master’s as a terminal degree, either in pursuit of their intellectual interests or to further their professional expertise. Students choose a master's degree with a focus on traditional and contemporary philosophy or one of three concentrations; ethics and public affairs, philosophy and cultural theory, or philosophy and public affairs. The concentration in philosophy and public affairs allows students in the graduate program in philosophy at Moscow's Higher School of Economics to also earn a degree from George Mason. All offerings provide grounding in the history of philosophy, ethics, metaphysics, epistemology, contemporary continental thought, contemporary analytic philosophy, and philosophy of science.

This program of study is offered by the Department of Philosophy.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in philosophy, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**
Students pursuing this degree must successfully complete 30 credits, which may include a thesis. They may choose a course of study that focuses on traditional and contemporary philosophy or choose to complete one of three concentrations. Students need to identify an advisor on entering the program and meet regularly with that advisor during their course of study.

MA with a Focus on Traditional and Contemporary Philosophy

The focus in traditional and contemporary philosophy is for students who want to deepen their understanding of philosophical issues and for students who are preparing to pursue doctoral studies in philosophy or related fields, e.g. political theory, gender studies. The concentration in philosophy and cultural theory is especially for students interested in pursuing a doctorate in cultural studies. The concentration in ethics and public affairs is designed for professionals who want to combine the study of ethics and the analysis of social and public policies in a variety of settings, including business, health care, biomedical technology, law, or government.

Students may apply up to 9 credits from other departments toward the degree with focus on traditional and contemporary philosophy with prior written approval of their advisor.

Four core courses (12 credits) in philosophy

One course (3 credits) in ancient or medieval philosophy chosen from:

PHIL 721 can be applied to this requirement when the topic is relevant and with approval of their advisor.

- PHIL 602 - Plato: Selected Dialogues Credits: 3
- PHIL 603 - Aristotle: Selected Works Credits: 3
- PHIL 604 - Augustine and Aquinas Credits: 3
- PHIL 681 - Ancient Philosophical Figures Credits: 3
- PHIL 691 - Special Topics in Ancient Philosophy Credits: 3

One course (3 credits) in modern philosophy chosen from:

PHIL 721 can be applied to this requirement when the topic is relevant and with approval of their advisor.

- PHIL 605 - Mind-Body Problem in Early Modern Philosophy Credits: 3
- PHIL 608 - Hegel's Phenomenology of the Spirit Credits: 3
- PHIL 682 - Early Modern Philosophical Figures Credits: 3
- PHIL 692 - Special Topics in Early Modern Philosophy Credits: 3

One course (3 credits) in contemporary philosophy chosen from:

PHIL 721 can be applied to this requirement when the topic is relevant and with approval of their advisor.

- PHIL 615 - Postmodernist Thought Credits: 3
- PHIL 616 - Phenomenology Credits: 3
- PHIL 618 - Contemporary French Feminism Credits: 3
- PHIL 683 - Contemporary Philosophical Figures Credits: 3
- PHIL 694 - Special Topics in Contemporary Philosophy Credits: 3
One advanced seminar (3 credits) chosen from:

- PHIL 720 - Nietzsche and his Readers Credits: 3
- PHIL 721 - Advanced Seminar in Philosophy Credits: 3
- PHIL 733 - Current Issues in Cognitive Science Credits: 3

Four to six elective courses (12-18 credits) in philosophy

Students who choose to write a thesis (3 or 6 credits) will take correspondingly fewer electives.

Thesis (3 or 6 credits) (optional)

Students must follow the thesis enrollment policy of the university and once enrolled in PHIL 799, maintain continuous enrollment as specified in the Academic Policies chapter of the catalog.

- PHIL 799 - Thesis Credits: 1-6

Total: 30 credits

▲ Concentration in Ethics and Public Affairs (ETPA)

The concentration in ethics and public affairs is designed for professionals who want to combine the study of ethics and the analysis of social and public policies in a variety of settings, including business, health care, biomedical technology, law, or government.

Two courses (6 credits) in the history of philosophy

One required course (3 credits)

- PHIL 640 - History of Ethical Theory Credits: 3

One elective course (3 credits) in the history of philosophy chosen from:

Depending on the topic, PHIL 681, 682, 691, or 692 may be applied to this concentration with prior written permission of the graduate director.

- PHIL 602 - Plato: Selected Dialogues Credits: 3
One course (3 credits) in public administration

- PUAD 540 - Public Policy Process Credits: 3

Three courses (9 credits) in ethics chosen from:

Other courses may be used to fulfill this requirement where appropriate and with prior written approval of the student's academic advisor.

- PHIL 642 - Biomedical Ethics Credits: 3
- PHIL 643 - Environmental Ethics Credits: 3
- PHIL 644 - Business and Organizational Ethics Credits: 3
- PHIL 645 - Research Ethics Credits: 3

Two to four elective courses (6 - 12 credits)

Students who choose to write a thesis (3 or 6 credits) will take correspondingly fewer electives. Students are encouraged to use courses from around the university in disciplines relevant to their areas of interest, subject to the prior written approval of their academic advisor. A small sample of possible electives outside the Department of Philosophy:

- PUAD 700 - Ethics and Public Administration Credits: 3
- HAP 714 - Ethical Issues in Health Administration and Policy Credits: 3
- EVPP 635 - Environment and Society Credits: 3

Thesis (3 or 6 credits) (optional)

Students must follow the thesis enrollment policy of the university and once enrolled in PHIL 799, maintain continuous enrollment as specified in the Academic Policies chapter of the catalog.

- PHIL 799 - Thesis Credits: 1-6

Total: 30 credits

▲ Concentration in Philosophy and Cultural Theory (PHCT)
The concentration in philosophy and cultural theory is especially for students interested in pursuing a doctorate in cultural studies.

Students may apply up to 9 credits from other departments toward this concentration with prior written approval of their advisor.

**Four core courses (12 credits) in philosophy**

**One course (3 credits) in ancient or medieval philosophy chosen from:**

PHIL 721 can be applied to this requirement when the topic is relevant and with approval of their advisor.

- PHIL 602 - Plato: Selected Dialogues Credits: 3
- PHIL 603 - Aristotle: Selected Works Credits: 3
- PHIL 604 - Augustine and Aquinas Credits: 3
- PHIL 681 - Ancient Philosophical Figures Credits: 3
- PHIL 691 - Special Topics in Ancient Philosophy Credits: 3

**One course (3 credits) in modern philosophy chosen from:**

PHIL 721 can be applied to this requirement when the topic is relevant and with approval of their advisor.

- PHIL 605 - Mind-Body Problem in Early Modern Philosophy Credits: 3
- PHIL 608 - Hegel's Phenomenology of the Spirit Credits: 3
- PHIL 682 - Early Modern Philosophical Figures Credits: 3
- PHIL 692 - Special Topics in Early Modern Philosophy Credits: 3

**One course (3 credits) in contemporary philosophy chosen from:**

PHIL 721 can be applied to this requirement when the topic is relevant and with approval of their advisor.

- PHIL 615 - Postmodernist Thought Credits: 3
- PHIL 616 - Phenomenology Credits: 3
- PHIL 618 - Contemporary French Feminism Credits: 3
- PHIL 683 - Contemporary Philosophical Figures Credits: 3
- PHIL 694 - Special Topics in Contemporary Philosophy Credits: 3

**One advanced seminar (3 credits) chosen from:**

- PHIL 720 - Nietzsche and his Readers Credits: 3
- PHIL 721 - Advanced Seminar in Philosophy Credits: 3
- PHIL 733 - Current Issues in Cognitive Science Credits: 3
Two courses (6 credits) in cultural studies

One required course (3 credits)
Students are encouraged to take this course as early in their program as possible.

- CULT 802 - Histories of Cultural Studies Credits: 3

One elective course (3 credits) in cultural studies
Students choose an elective in consultation with an advisor.

Two to four elective courses (6 - 12 credits) in philosophy
Students who choose to write a thesis (3 or 6 credits) will take correspondingly fewer electives.

Thesis (3 or 6 credits) (optional)
Students must follow the thesis enrollment policy of the university and once enrolled in PHIL 799, maintain continuous enrollment as specified in the Academic Policies chapter of the catalog.

- PHIL 799 - Thesis Credits: 1-6

Total: 30 credits

▲Concentration in Philosophy and Public Affairs (PPAF)

The concentration in philosophy and public affairs allows students in the graduate program in philosophy at Moscow's Higher School of Economics to also earn a degree from George Mason.

Four core courses (equivalent of 12 credits) taken at Moscow's Higher School of Economics

- History of Philosophy: Philosophical Anthropology
- Practical Philosophy: Philosophical Anthropology
- Practical Philosophy: Contemporary Problems of Philosophy
- One elective course in philosophy or ethics

Two courses (6 credits) in ethics chosen from:
• PHIL 642 - Biomedical Ethics Credits: 3
• PHIL 643 - Environmental Ethics Credits: 3
• PHIL 644 - Business and Organizational Ethics Credits: 3
• PHIL 645 - Research Ethics Credits: 3

Three to four elective courses (9-12 credits) in philosophy

Students who choose to write a thesis will take 3 fewer electives.

Thesis (3 credits) (optional)

Students who choose to write a thesis should be aware of the policies governing theses as stated in the Academic Policies chapter of this catalog.

• PHIL 799 - Thesis Credits: 1-6

Total: 30 credits

■ Psychology

Phone: 703-993-1342
Web: psychology.gmu.edu

Faculty

Professors: Ascoli, Boehm-Davis, Cortina, Denham (director, Applied Developmental Program), Klimoski, Mandes, Parasuraman (director, Human Factors/Applied Cognition Program), Pasnak, Riskind, Rojahn, Smith (director, Cognitive and Behavioral Neuroscience Program and interim chair), Tangney (director, Clinical Program), Tetrick (director, Industrial/Organizational Program), Winsler, Zaccaro

Research professors: Butler, Olds

Associate professors: Baldwin, Bitler, Blackwell, Buffardi, Cattaneo, Dalal (associate chair for graduate studies), Flinn (director, Neuroscience undergraduate studies), Kashdan, King, McKnight, Peterson, Sanford (associate chair for undergraduate studies), Short

Research associate professors: Greenwood, Stuewig

Assistant professors: Chazen-Cohen, Curby,Esposito-Smythers, Kaplan, McDonald, Renshaw, Rowe, Shaw, Thompson, Youmans

Term associate professors: Chrosniak, Foehlinger (director, School Psychology Program), Mehlenbeck, Wanschura

Research assistant professors: Bassett, Lim, Strenziok
Term assistant professors: Battaglia, Hurley, Thompson (director, Center for Cognitive Development)

Affiliates: Eby, Hunt, Bachus

Course Work

The Psychology Department offers all course work designated PSYC in the Courses chapter of this catalog.

Undergraduate Programs

The department offers a bachelor of arts degree and a bachelor of science degree in psychology. All psychology majors complete a broad range of courses from social and abnormal psychology to cognitive and biopsychology. Students can also choose from special topics courses such as forensic psychology and romantic relationships.

In addition to the general degree in psychology, students can choose a concentration in work and organizational psychology. This concentration may be of interest to students who are planning to attend graduate school in industrial and organization (I/O) psychology or a related field such as organizational behavior or human resources management.

Students in psychology may have the opportunity to do research with a faculty member or do a service learning course, which allows them to put into practice what they've learned in the classroom.

Students interested in graduate study should be aware that undergraduate research experience and letters of recommendation are major factors for admission to graduate study. Such students should distribute courses across a number of areas in psychology and work closely with one or more professors on individual projects during their junior and senior years.

Honors in the Major

Highly qualified students may apply to graduate with honors in the major. To be eligible for admission, psychology majors must have completed at least 50 credits and have a minimum cumulative GPA of 3.25 and a minimum GPA of 3.40 in psychology courses.

If accepted, students must take a sequence of three courses (PSYC 490, 491, and 492), which culminates in the successful completion and presentation of an independent honors thesis. To graduate with honors, students must earn a minimum GPA of 3.50 in their honors courses and maintain a minimum cumulative GPA of 3.25 and a minimum GPA of 3.40 in psychology courses.

Minor

The department offers a minor in psychology available to students in any major in the university.

Bachelor’s/Accelerated Master’s Program

The department offers highly qualified undergraduate majors the opportunity to apply to an accelerated master’s degree program in psychology with a concentration in biopsychology. If accepted, students will be able to earn both an undergraduate degree and the master's degree with a concentration in biopsychology after satisfactory completion of 146 credits, sometimes within five years.

Graduate Programs
The graduate programs in psychology are distinguished by an emphasis on basic research and the application of research to solving practical problems in families, schools, industry, government, and health care settings.

The department offers master's and doctoral degrees with concentrations in applied developmental psychology, cognitive and behavioral neuroscience, human factors/applied cognition, and industrial/organizational psychology. They offer a doctoral degree with a concentration in clinical psychology. Finally, they offer a master's degree with a concentration and certificate in school psychology.

**Funding**

The department offers teaching and research assistantships, which are awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students awarded assistantships must register for a minimum of six credits a semester and show satisfactory progress toward their degree.

**Certificates**

The department offers graduate certificates in aviation psychology, usability, and cognitive neuroscience. These have been designed to meet the needs of students who desire to upgrade their skills and earn a certificate as evidence of their skill attainment. Students may take these as stand-alone certificates or pursue them concurrently with a graduate degree program. Part of the certificate course work may be able to be applied to the degree. Students must apply and be accepted to a graduate certificate program.

The certificate programs are open to all students who hold a bachelor’s degree from an accredited university and meet the admissions requirements for the master's degree in psychology with a concentration in human factors and applied cognition.

**Nondegree Status**

Applicants who have not been admitted to a graduate degree program or a certificate program may apply for nondegree status. Nondegree students must meet the same admission requirements as degree-seeking students. Nondegree status is not intended as a way to qualify for admission as a degree-seeking student.

While it may be possible to transfer the credits earned in nondegree status to a degree program, such transfers are not automatic. They require the approval of the graduate director and the dean. If approved, a maximum of 12 credits earned in nondegree status may be applied to a degree program. Nondegree students who intend to transfer their credits to a degree program should discuss this with the appropriate program director.

**Undergraduate Degree**

**Neuroscience, BS**

**Banner Code:** LA-BS-NEUR

Web: psychology.gmu.edu

The bachelor of science in neuroscience is an interdisciplinary program emphasizing the relationship between the biology and chemistry of the nervous system and behavior of an organism. The BS in neuroscience prepares students for graduate-level study in both medical school and doctoral and master’s-level programs in neuroscience and other health-related fields, and work in the neuroscience field.
This program of study is offered by the Department of Psychology.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BS in neuroscience must complete additional college requirements for the BS degree in the College of Humanities and Social Sciences.

The program requirements meet the university general education requirements in quantitative reasoning, social and behavioral science, and natural science.

Foundation courses

Two courses in biology (7-8 credits)

Students must earn a minimum grade of 1.67 (C-) in each of these courses.

One required course (4 credits)

- BIOL 213 - Cell Structure and Function Credits: 4

One course (3-4 credits) chosen from:

The course chosen to fulfill this requirement cannot be applied to the 24 credits of approved neuroscience electives.

- BIOL 311 - General Genetics Credits: 4
- BIOL 320 - Comparative Chordate Anatomy Credits: 4
- BIOL 322 - Developmental Biology Credits: 4
- BIOL 326 - Animal Physiology Credits: 3
- BIOL 425 - Human Physiology Credits: 3

Two courses in chemistry (8 credits)

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4

One course in mathematics (3 or 4 credits) chosen from:
Students intending to pursue a doctorate in neuroscience or a medical degree are advised to take MATH 114.

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 213 - Analytic Geometry and Calculus III Credits: 3

One course in statistics (3 or 4 credits) chosen from:

- STAT 250 - Introductory Statistics I Credits: 3
- PSYC 300 - Statistics in Psychology Credits: 4
- MATH 352 - Statistics Credits: 3
- BIOL 312 - Biostatistics Credits: 4

Four courses in physics (8 credits)

Students should take one of the following sequences.

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1
  or
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

Three courses in psychology (9 credits)

Students must earn a minimum grade of 1.67 (C-) in each of these courses. Transfer students who have earned transfer credit for PSYC 372 may substitute this course for PSYC 375.

- PSYC 100 - Basic Concepts in Psychology Credits: 3
- PSYC 375 - Brain and Behavior I Credits: 3
- PSYC 376 - Brain and Behavior II Credits: 3

One course in computer science (3 credits)

- CDS 130 - Computing for Scientists Credits: 3

Two core courses in neuroscience (6 credits)
Students must earn a minimum grade of 1.67 (C-) in each of these courses.

- NEUR 327 - Cellular, Neurophysiological, and Pharmacological Neuroscience Credits: 3
- NEUR 335 - Molecular, Developmental, and Systems Neuroscience Credits: 3

One course in technical writing (3 credits)

Students must earn a minimum grade of 1.67 (C-) in this course.

- NEUR 410 - Current Topics in Neuroscience Credits: 3

One required psychology lab course (1 credit)

Students must earn a minimum grade of 1.67 (C-) in this course.

- PSYC 373 - Physiological Psychology Laboratory Credits: 1

Electives (24 credits)

Students should consult with an advisor to choose appropriate elective courses, which must be approved by the director of the program. A sample of possible electives is given below. Students may apply no more than 6 credits of courses with D to this requirement.

Students intending to pursue a doctorate in neuroscience or a medical degree are advised to take CHEM 313 and 315.

- BIOL 305 - Biology of Microorganisms Credits: 3 and BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 311 - General Genetics Credits: 4
- BIOL 320 - Comparative Chordate Anatomy Credits: 4
- BIOL 322 - Developmental Biology Credits: 4
- BIOL 326 - Animal Physiology Credits: 3
- BIOL 327 - Animal Physiology Laboratory Credits: 2
- BIOL 425 - Human Physiology Credits: 3
- BIOL 452 - Immunology Credits: 3
- BIOL 453 - Immunology Laboratory Credits: 1
- BIOL 471 - Evolution Credits: 3
- BIOL 483 - General Biochemistry Credits: 4
- BIOL 484 - Eukaryotic Cell Biology Credits: 3
- BIOL 515 - Introduction to Neurobiology Credits: 2
- CHEM 313 - Organic Chemistry Credits: 3 and CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 314 - Organic Chemistry Credits: 3 and CHEM 318 - Organic Chemistry Lab II Credits: 2
- CHEM 321 - Elementary Quantitative Analysis Credits: 4
- CHEM 331 - Physical Chemistry I Credits: 3 and CHEM 336 - Physical Chemistry Lab I Credits: 2
- CHEM 332 - Physical Chemistry II Credits: 3 and CHEM 337 - Physical Chemistry Lab II Credits: 2
- CHEM 333 - Physical Chemistry for the Life Sciences I Credits: 3
- CHEM 334 - Physical Chemistry for the Life Sciences II Credits: 3
- CHEM 463 - General Biochemistry I Credits: 4 and CHEM 465 - Biochemistry Lab Credits: 2
• CHEM 464 - General Biochemistry II Credits: 3
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• MATH 203 - Linear Algebra Credits: 3
• MATH 213 - Analytic Geometry and Calculus III Credits: 3
• MATH 214 - Elementary Differential Equations Credits: 3
• MATH 446 - Numerical Analysis I Credits: 3
• MATH 447 - Numerical Analysis II Credits: 3
• NEUR 461 - Special Topics in Neuroscience Credits: 1-3
• PHYS 262 - University Physics III Credits: 3
• PHYS 263 - University Physics III Laboratory Credits: 1
• PSYC 304 - Principles of Learning Credits: 4
• PSYC 309 - Sensation, Perception, and Information Processing Credits: 4
• PSYC 317 - Cognitive Psychology Credits: 3
• PSYC 472 - Advanced Physiological Psychology Credits: 3

Total: 75-78 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in neuroscience may fulfill this requirement by successfully completing NEUR 410.

Psychology, BA

Banner Code: LA-BA-PSYC

Web: psychology.gmu.edu

This program of study is offered by the Department of Psychology.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor’s degrees, including university general education requirements. Students pursuing a BA in psychology must complete additional college requirements for BA degrees in the College of Humanities and Social Sciences. Students pursuing this degree must complete 36 credits in psychology with 24 credits at the 300 and 400 level. Students must have a minimum GPA of 2.00 in these 36 credits and a minimum grade of 1.67 (C-) in each of the courses.

See Notes at the end of this section for recommendations and restrictions.

Students may meet the applied psychology requirement by completing a concentration in work and organizational psychology. This concentration may be of interest to students who are planning to attend graduate school in industrial and organizational (I/O) psychology or a related field such as organizational behavior or human resources management. Students who are considering a career in business may find this concentration advantageous for careers in training and development, human resources, and management.
Basic courses in psychology (22-28 credits)

One introductory courses (3 credits)

- PSYC 100 - Basic Concepts in Psychology Credits: 3

Three or four foundational courses (9 or 12 credits)

One or two courses (3 or 6 credits) chosen from:

Choose either:
- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 313 - Child Psychology Credits: 3
- PSYC 314 - Adolescent Psychology Credits: 3
- PSYC 415 - Psychological Factors in Aging Credits: 3

One course (3 credits) in cognitive psychology

- PSYC 317 - Cognitive Psychology Credits: 3

One course (3 credits) in social psychology

- PSYC 231 - Social Psychology Credits: 3

One or two courses in biopsychology (3 or 6 credits)

- PSYC 372 - Physiological Psychology Credits: 3
  or
- PSYC 375 - Brain and Behavior I Credits: 3 AND PSYC 376 - Brain and Behavior II Credits: 3
Two research methods courses (7 credits)

- PSYC 300 - Statistics in Psychology Credits: 4
- PSYC 301 - Research Methods in Psychology Credits: 3

Total: (22-28 credits)

Applied psychology courses (6-13 credits)

Students pursuing a BA in psychology complete 2 applied psychology courses (6-7 credits) chosen from the list below. Alternatively, students may earn a concentration in work and organizational psychology by completing additional credits of applied psychology as outlined.

Two courses in applied psychology (6-7 credits) chosen from:

- PSYC 320 - Psychological Tests and Measurements Credits: 4
- PSYC 325 - Abnormal Psychology Credits: 3
- PSYC 333 - Industrial and Organizational Psychology Credits: 3
- PSYC 379 - Applied Cross-Cultural Psychology Credits: 3
- PSYC 427 - Community Engagement for Social Change Credits: 3

OR completion of the concentration

▲Concentration in Work and Organizational Psychology (WKOP) [12-13 credits]

Students must earn a minimum GPA of 2.00 in all coursework applied to the concentration.

Students who successfully complete the Psychology Department Honors Program (PSYC 490, 491, and 492) with an honors thesis/project focused on I/O psychology may, with approval of their thesis committees and the associate chair for undergraduate studies, substitute their honors work for one course in the concentration. Specific requirements for the concentration are listed below.

One required applied psychology course (3 credits)

- PSYC 333 - Industrial and Organizational Psychology Credits: 3

Three courses (9-10 credits) chosen from:
- PSYC 320 - Psychological Tests and Measurements Credits: 4
- PSYC 335 - Psychology of Creativity and Innovation Credits: 3
- PSYC 435 - Personnel Training and Development: A Psychological Perspective Credits: 3
- PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3
- PSYC 461 - Special Topics Credits: 1-3 (only when topic is Work and Family with prior written approval)

Total: 12-13 credits

Elective courses in psychology (1-8)

Students complete the 36 required credits with electives in psychology (PSYC). PSYC 465 is strongly recommended for all students who plan to attend graduate school in psychology.

Total: 36 credits

Notes

It is strongly recommended that students fulfill the general education natural science requirement by completing BIOL 103 and 104 because these courses are prerequisites to the requirement of PSYC 372 or PSYC 375, 376. Students who have limited technology skills are encouraged to take IT 103.

PSYC 372 may be used in place of PSYC 375 only by students who receive PSYC 372 transfer credit from another institution.

Students who receive transfer credit for a research methods course must take PSYC 304, PSYC 309, or PSYC 323 unless the transfer courses has been approved as writing intensive.

Students are strongly encouraged to complete PSYC 300 and 301 by their junior year. PSYC 300 is a prerequisite to several courses, and a background in research methods facilitates understanding empirical research discussed in all psychology courses.

Any psychology course may be used to satisfy the 36-credit psychology requirement for the BA degree with the following restrictions:

- A maximum of 6 credits of 327, 328, 421, and 422 may be applied to required psychology credits
- A maximum of 6 credits of 260, 350, and 460 may be applied to required psychology credits
- No more than 9 credits can be taken from the courses listed in the two bullets above without written permission of the department chair
- PSYC 330 may not be taken for credit by psychology majors

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in psychology may fulfill this requirement by successfully completing PSYC 301, 304, 309, or 323.
Psychology, BS

Banner Code: LA-BS-PSYC

Web: psychology.gmu.edu

This program of study is offered by the Department of Psychology. The department also offers a BA in psychology and coordinates the BS in neuroscience.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BS in psychology must complete additional college requirements for the BS degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete at least 38 credits in psychology and 35 credits in supporting courses.

See Notes at the end of this section for recommendations and restrictions.

The department offers a concentration in work and organizational psychology that can be completed and noted on the student's transcript. This concentration may be of interest to students who are planning to attend graduate school in industrial and organizational (I/O) psychology or a related field such as organizational behavior or human resources management. Students who are considering a career in business may find this concentration advantageous for careers in training and development, human resources, and management. Students who successfully complete the Psychology Department Honors Program (PSYC 490, 491, and 492) with an honors thesis/project focused on I/O psychology may, with approval of their thesis committees and the associate chair for undergraduate studies, substitute their honors work for one course in the concentration. Specific requirements for the concentration are listed below.

Psychology courses (38 credits)

Students must have a minimum GPA of 2.00 in these courses with a minimum grade of 1.67 (C-) in each one. 24 credits must be at the 300 and 400 level.

One introductory course (3 credits)

- PSYC 100 - Basic Concepts in Psychology Credits: 3

One or two courses in developmental psychology (3-6 credits) chosen from:

- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 313 - Child Psychology Credits: 3
- PSYC 314 - Adolescent Psychology Credits: 3
One core course (3 credits) in social psychology

- PSYC 231 - Social Psychology Credits: 3

Two courses (7 credits) in research methods

- PSYC 300 - Statistics in Psychology Credits: 4
- PSYC 301 - Research Methods in Psychology Credits: 3

One psychology lab course (1 or 4 credits) chosen from:

The course chosen to fulfill this requirement cannot be the same course used to fulfill the technical writing requirement below.

- PSYC 304 - Principles of Learning Credits: 4
- PSYC 309 - Sensation, Perception, and Information Processing Credits: 4
- PSYC 320 - Psychological Tests and Measurements Credits: 4
- PSYC 323 - Clinical and Social Psychology Research Techniques Credits: 4
- PSYC 373 - Physiological Psychology Laboratory Credits: 1

One core course (3 credits) in cognitive psychology

- PSYC 317 - Cognitive Psychology Credits: 3

One or two courses in biopsychology (3 or 6 credits) chosen from:

- PSYC 372 - Physiological Psychology Credits: 3
  or
- PSYC 375 - Brain and Behavior I Credits: 3 and PSYC 376 - Brain and Behavior II Credits: 3

Applied psychology courses (6-13 credits)

Students pursuing a BS in psychology complete 2 applied psychology courses (6-7 credits) chosen from the list below. Alternatively, students may earn a concentration in work and organizational psychology by completing additional credits of applied psychology as outlined.

Two courses in applied psychology (6 or 7 credits) chosen from:
• PSYC 320 - Psychological Tests and Measurements Credits: 4
• PSYC 325 - Abnormal Psychology Credits: 3
• PSYC 333 - Industrial and Organizational Psychology Credits: 3
• PSYC 379 - Applied Cross-Cultural Psychology Credits: 3
• PSYC 427 - Community Engagement for Social Change Credits: 3

OR completion of the concentration

▲Concentration in Work and Organizational Psychology (WKOP) [12-13 credits]

Students must earn a minimum GPA of 2.00 in all coursework applied to the concentration.

Students who successfully complete the Psychology Department Honors Program (PSYC 490, 491, and 492) with an honors thesis/project focused on I/O psychology may, with approval of their thesis committees and the associate chair for undergraduate studies, substitute the honors work for one course in the concentration. Specific requirements for the concentration are listed below.

One required applied psychology course (3 credits)

• PSYC 333 - Industrial and Organizational Psychology Credits: 3

Three courses (9-10 credits) chosen from:

• PSYC 320 - Psychological Tests and Measurements Credits: 4
• PSYC 335 - Psychology of Creativity and Innovation Credits: 3
• PSYC 435 - Personnel Training and Development: A Psychological Perspective Credits: 3
• PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3
• PSYC 461 - Special Topics Credits: 1-3 (only when topic is Work and Family with prior written approval)

Total: 12-13 credits

Psychology electives (0-9 credits)

Students complete the 38 required credits with electives in psychology (PSYC). PSYC 465 is strongly recommended for all students who plan to attend graduate school in psychology. No more than 6 credits of D may be applied toward this requirement.

Total: 38 credits
Supporting courses (35-40 credits)

One course (3-4 credits) in technical writing chosen from:

- ENGH 388 - Professional and Technical Writing Credits: 3
- PSYC 304 - Principles of Learning Credits: 4
- PSYC 309 - Sensation, Perception, and Information Processing Credits: 4
- PSYC 323 - Clinical and Social Psychology Research Techniques Credits: 4

Four courses (14-16 credits) of natural science

Two required science courses (8 credits)

- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 104 - Introductory Biology II Credits: 4

Two elective science courses (6-8 credits)

Students fill this requirement with any two courses in the natural sciences.

Two courses (6-8 credits) of quantitative reasoning chosen from:

- MATH 108 - Introductory Calculus with Business Applications Credits: 3
- MATH 110 - Introductory Probability Credits: 3
- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- STAT 250 - Introductory Statistics I Credits: 3

One course (3 credits) in humanities

Students can choose courses from PHIL (but not 173 or 376), RELI, ARTH, AVT, MUSI, DANC, THR.

Two courses (6 credits) in social and behavioral science
Students can choose courses from ANTH, ECON, GOVT, HIST, SOCI or any non-psychology course that has been approved to meet the university general education requirement in social and behavioral science. Courses in psychology may not be used to fulfill this requirement.

One additional course (3 credits) in humanities or social and behavioral science

Students choose an additional course from the lists under the requirements in humanities and social sciences above (and with the same restrictions).

Total: 73-78 credits

Notes

Students who have limited technology skills are encouraged to take IT 103.

PSYC 372 may be used in place of PSYC 375 only by students who receive PSYC 372 transfer credit from another institution.

Students who receive transfer credit for a research methods course must take PSYC 304, PSYC 309, or PSYC 323 unless the transfer courses has been approved as writing intensive.

Students are strongly encouraged to complete PSYC 300 and 301 by their junior year. PSYC 300 is a prerequisite to several courses, and a background in research methods facilitates understanding empirical research discussed in all psychology courses.

Students who have a strong interest in biopsychology or cognitive neuroscience are encouraged to take PSYC 375-376 rather than PSYC 372.

Any psychology course may be used to satisfy the 38-credit psychology requirement for the BS degree with the following restrictions:

- A maximum of 6 credits of 327, 328, 421, and 422 may be applied to required psychology credits
- A maximum of 6 credits of 260, 350, and 460 may be applied to required psychology credits
- No more than 9 credits can be taken from the courses listed in the two bullets above without written permission of the department chair
- PSYC 330 may not be taken for credit by psychology majors

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in psychology may fulfill this requirement by successfully completing PSYC 301, 304, 309, or 323.

Undergraduate Minor

Neuroscience Minor

Banner Code: NEUR
Neuroscience is one of the most rapidly growing disciplines in science today. Due to its interdisciplinary nature, it draws on skills from anatomy, chemistry, electrical engineering, genetics, math, and psychology, among others. Students in these fields can benefit from an awareness of applications of these fields to neuroscience and through this minor, more directly prepare for later work in neuroscience.

**Course Work**

Students pursuing this minor must complete at least 20 credits of coursework with a minimum GPA of 2.00.

**Two biology courses (7-8 credits)**

**One required course (4 credits)**

- BIOL 213 - Cell Structure and Function Credits: 4

**One elective course (3-4 credits) chosen from:**

- BIOL 311 - General Genetics Credits: 4
- BIOL 320 - Comparative Chordate Anatomy Credits: 4
- BIOL 322 - Developmental Biology Credits: 4
- BIOL 326 - Animal Physiology Credits: 3
- BIOL 425 - Human Physiology Credits: 3

**Three psychology courses (7 credits)**

- PSYC 373 - Physiological Psychology Laboratory Credits: 1
- PSYC 375 - Brain and Behavior I Credits: 3
- PSYC 376 - Brain and Behavior II Credits: 3

**Two neuroscience courses (6 credits)**

- NEUR 327 - Cellular, Neurophysiological, and Pharmacological Neuroscience Credits: 3
- NEUR 335 - Molecular, Developmental, and Systems Neuroscience Credits: 3
Total: 20-21 credits

Psychology Minor

Banner Code: PSYC

Web: psychology.gmu.edu

Coursework in psychology can enhance many different majors, and the minor in psychology is available to students in any major at Mason. For a list of suggested courses for students who are majoring in specific disciplines that interact especially well with psychology, contact the Undergraduate Psychology Office.

This program of study is offered by the Department of Psychology.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits of psychology with a minimum GPA of 2.0.

One required course (3 credits)

- PSYC 100 - Basic Concepts in Psychology Credits: 3

Three courses (9 credits) in three of the following areas of psychology

Students must choose cognition or physiological as one of the three areas, though they may choose both.

Abnormal

- PSYC 325 - Abnormal Psychology Credits: 3

Cognition

- PSYC 317 - Cognitive Psychology Credits: 3

Developmental
- PSYC 211 - Developmental Psychology Credits: 3
- PSYC 313 - Child Psychology Credits: 3

Physiological

- PSYC 372 - Physiological Psychology Credits: 3
  or
- PSYC 375 - Brain and Behavior I Credits: 3 and PSYC 376 - Brain and Behavior II Credits: 3

Social/personality

- PSYC 231 - Social Psychology Credits: 3
- PSYC 324 - Personality Theory Credits: 3

Psychology electives (6 credits)

No more than three credits of PSYC 260, 350, and 460 (in total) may be used as elective credit toward the minor.

Total: 18 credits

Bachelor's/Accelerated Master's Program

Psychology, BA or BS/Psychology, Accelerated MA (Cognitive and Behavioral Neuroscience)

Web: psychology.gmu.edu

Highly qualified Mason psychology majors may apply to the accelerated master's degree. If accepted, students will be able to earn a BA or BS in psychology and a MA in psychology with a concentration in cognitive and behavioral neuroscience after satisfactory completion of 146 credits.

The accelerated MA in psychology is available only to students pursuing the MA in psychology with a concentration in cognitive and behavioral neuroscience.

This program of study is offered by the Department of Psychology.

For policies governing all master's degree, see the Academic Policies chapter of the catalog.
Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to this program, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

Master’s Degree

Psychology, MA

Banner Code: LA-MA-PSYC

Web: psychology.gmu.edu

The master's degree in psychology has concentrations in applied developmental psychology, cognitive and behavioral neuroscience, human factors/applied cognition, industrial/organizational psychology, and school psychology. The department does not offer a master's degree in clinical or counseling psychology, but a master's degree in psychology with a concentration in clinical psychology is available for students who have been admitted to the doctoral program concentration in clinical psychology.

This program of study is offered by the Department of Psychology.

For policies governing all master's degree, see the Academic Policies chapter of the catalog.

Application Requirements
Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in psychology, see Application Requirements and Deadlines on the departmental web site.

Provisional Admission

Students who are admitted provisionally are required to take 12 credits in psychology and earn a minimum GPA of 3.25 in those courses to qualify for removal of the provisional qualifier. Programs may add other conditions to provisional admission. Individualized study courses cannot be used toward the 12 credits.

Degree Requirements

In addition to satisfying the requirements for all master’s degrees, students pursuing a master's degree in psychology must successfully complete 32-46 credits of required course work. They complete this coursework in one of six concentrations.

A maximum of 6 credits of thesis proposal and thesis research (PSYC 798, 799) may be applied to the master's degree. A maximum of 9 credits of thesis courses (798, 799), Directed Reading and Research (597), and Practicum (792) may be applied to the degree.

▲ Concentration in Applied Developmental Psychology (APD)

The concentration in applied developmental psychology focuses on child development. It provides basic knowledge about normal development, skills for assessing developmental level, and techniques for planning and evaluating programs that foster optimal development. Graduates are prepared for employment at agencies concerned with educational and health programs for children, enrichment programs for infants and preschoolers, and education programs for parents.

Two core courses (6 credits) chosen from:

Social

- PSYC 667 - Behavior in Small Groups and Teams Credits: 3
- PSYC 668 - Personality: Theoretical and Empirical Approaches Credits: 3
- PSYC 703 - Social Bases of Behavior Credits: 3

Biological

- PSYC 558 - Neuronal Bases of Learning and Memory Credits: 3
- PSYC 559 - Behavioral Chemistry Credits: 3
- PSYC 702 - Biological Bases of Human Behavior Credits: 3

Cognitive
• PSYC 701 - Cognitive Bases of Behavior Credits: 3
• PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Two courses (8 credits) of quantitative methods

• PSYC 611 - Advanced Statistics Credits: 4
• PSYC 612 - Advanced Statistics Credits: 4

Three courses (9 credits) of specialized content

At least 3 credits must be from courses that are distinctly developmental in nature (e.g. PSYC 615, 666, 669).

• PSYC 592 - Special Topics Credits: 1-6 (when the content is developmental)
• PSYC 614 - The Psychology of Aging Credits: 3
• PSYC 615 - Language Development Credits: 3
• PSYC 617 - Child Psychopathology Credits: 3
• PSYC 619 - Applied Behavior Analysis: Principles, Procedures, and Philosophy Credits: 3
• PSYC 630 - Developmental Disabilities Credits: 3
• PSYC 648 - Developmental Psychopathology Credits: 3
• PSYC 666 - Cognitive and Perceptual Development Credits: 3
• PSYC 669 - Social and Emotional Development Credits: 3
• PSYC 704 - Life-Span Development Credits: 3
• PSYC 780 - Applied Developmental Psychology Credits: 3

Thesis research or practicum experience (4 credits) chosen from one of these options:

Thesis (4 credits)

• PSYC 798 - Thesis Proposal Credits: 1-6
• PSYC 799 - Master's Thesis Credits: 1-6

Practicum (4 credits)

Practicum is 3 credits of 792 and 1 credit of 597.

• PSYC 792 - Practicum in Developmental Psychology, Biopsychology, and School Psychology Credits: 1-6
• PSYC 597 - Directed Reading and Research Credits: 1-6
Professional seminar (2 credits)

Students should take 1 credit in fall and 1 credit in spring of their first year.

- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Electives (3 credits)

Students complete the 32 credits required for this concentration through a content course, directed reading and research, or additional credits of practicum or thesis.

Total: 32 credits

▲ Concentration in Cognitive and Behavioral Neuroscience (CBNR)

The concentration in cognitive and behavioral neuroscience focuses on studying biological substrates of behavior. Core and affiliated faculty study areas as diverse as neural control of behavioral development; brain systems in substance abuse; animal models of learning and memory and their disorders (such as Alzheimer's); human brain systems involved in cognition, perception, human error, decision making, and movement; the relation of neural activity to human performance; and cognitive aging. A focus of the program is on translational neuroscience-complementary study of neural systems in humans and animals, including application of animal research to human behavior.

Two courses (5 credits) of specialized content

- PSYC 527 - Introduction to Neurobiology Credits: 2
- PSYC 558 - Neuronal Bases of Learning and Memory Credits: 3

One chemistry course (3 credits) chosen from:

- PSYC 556 - Chemistry and the Brain Credits: 3
- PSYC 559 - Behavioral Chemistry Credits: 3
- PSYC 592 - Special Topics Credits: 1-6 (when topic is Biological Bases of Mental Illness and Drug Abuse)

Two courses (8 credits) of quantitative methods

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4
Professional seminar (1 credit)

- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Elective courses (at least 9 credits)

Students complete the 32 credits required for the degree through additional credits of course work or research. They can choose from courses below or other courses with the approval of their advisor. Students intending to pursue a doctorate are strongly advised to take PSYC 531.

- PSYC 531 - Mammalian Neurobiology Credits: 3
- PSYC 552 - Histology/Histochemistry of the Brain Credits: 5
- BIOL 583 - General Biochemistry Credits: 4
- PSYC 561 - Behavioral Biology of Substance Abuse Credits: 3
- PSYC 702 - Biological Bases of Human Behavior Credits: 3
- PSYC 704 - Life-Span Development Credits: 3

Thesis (6 credits)

A thesis is normally required, but 6 credits of PSYC 792 - Practicum may serve as a substitute if approved by the advisor and program coordinator.

- PSYC 798 - Thesis Proposal Credits: 1-6
- PSYC 799 - Master's Thesis Credits: 1-6

Total: 32 credits

▲ Concentration in Clinical Psychology (CLN)

The clinical psychology concentration trains students to have flexibility to fill the evolving functions of clinical psychologists, including research, direct provision of clinical services, supervision, program development and evaluation, and consultation.

The clinical psychology MA concentration is not a terminal degree. Students who have been admitted to the doctoral program with a concentration in clinical psychology may apply to receive the MA in psychology on completion of 31 credits of course work. Students must also be in good standing in the program, as determined by the director of clinical training.

Four foundation courses (14 credits)

- PSYC 810 - Psychological Assessment I Credits: 4
• PSYC 811 - Psychological Assessment II Credits: 4
• PSYC 822 - Scientific Foundations of Clinical Psychology I Credits: 3
• PSYC 860 - Introductory Helping Skills and Motivational Interviewing Credits: 3

Three courses (11 credits) in advanced statistics and research methods

• PSYC 611 - Advanced Statistics Credits: 4
• PSYC 612 - Advanced Statistics Credits: 4
• PSYC 644 - Methods for Social Research Credits: 3

Two practicum courses (6 credits)

• PSYC 861 - Cognitive Behavioral Therapy for Youth Credits: 3
• PSYC 862 - Cognitive Behavioral Therapy for Adults Credits: 3

Total: 31 credits

▲ Concentration in Human Factors/Applied Cognition (HF)

The human factors/applied cognition concentration trains students in the application of cognitive science to real-world problems. Students gain expertise in such areas as human/computer interaction, cognitive system engineering, cognitive ergonomics, and transportation. Faculty members help place students who do not have real-world experience in a part- or full-time practicum before completing the degree.

One core course (3 credits) chosen from:

• PSYC 701 - Cognitive Bases of Behavior Credits: 3
• PSYC 759 - Applied Decision Making Credits: 3
• PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Two courses (8 credits) of quantitative methods

• PSYC 611 - Advanced Statistics Credits: 4
• PSYC 612 - Advanced Statistics Credits: 4

Two courses (6 credits) of specialized content
- PSYC 530 - Cognitive Engineering: Cognitive Science Applied to Human Factors Credits: 3
- PSYC 645 - Research Methods in Human Factors and Applied Cognition Credits: 3

Two courses (6 credits) which may be repeated, chosen from:

- PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3
- PSYC 737 - Psychology of Human-Technology Interaction Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Electives (0-9 credits)

Students complete the 32 credits required for this degree through additional course work, including courses not listed above, within or outside the department, with prior written approval of the graduate director.

Practicum (optional) (6 credits)

Students need an advisor's approval to register for practicum.

- PSYC 792 - Practicum in Developmental Psychology, Biopsychology, and School Psychology Credits: 1-6

Thesis (optional) (6 credits)

Students need the chair's approval to register for thesis.

- PSYC 798 - Thesis Proposal Credits: 1-6
- PSYC 799 - Master's Thesis Credits: 1-6

Total: 32 credits

▲ Concentration in Industrial/Organizational Psychology (IO)

The industrial/organizational psychology concentration trains students in the conduct and application of psychological research in work settings. Expertise can be developed in a variety of areas, including personnel selection, training, leadership, motivation, and human performance assessment.

One core course (3 credits)

- PSYC 703 - Social Bases of Behavior Credits: 3
Three courses (at least 10 credits) of statistics

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4 or PSYC 754 - Quantitative Methods III: Psychological Applications of Regression Techniques Credits: 3
- PSYC 557 - Psychometric Methods or PSYC 633 - Evaluative Research in Psychology Credits: 3

Two courses (6 credits) of survey of content

- PSYC 636 - Survey of Industrial Psychology Credits: 3
- PSYC 639 - Survey of Organizational Processes Credits: 3

Three courses (9 credits) of specialized content chosen from:

When their topic is relevant, other courses, including sections of PSYC 592, may be applied to this requirement.

- PSYC 638 - Training: Psychological Contributions to Theory, Design, and Evaluation Credits: 3
- PSYC 640 - Techniques in Industrial/Organizational Psychology Credits: 3
- PSYC 733 - Issues in Personnel Psychology Credits: 3
- PSYC 741 - Psychology of Work Motivation Credits: 3
- PSYC 667 - Behavior in Small Groups and Teams Credits: 3
- PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
- PSYC 739 - Seminar in Industrial/Organizational Psychology Credits: 3

1 credit of professional development chosen from:

- Practicum (Students need an advisor’s approval to register for practicum.)
- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Electives (0-3 credits)

Students complete the 32 credits required for this degree through additional course work in statistics or specialized content.

Total: 32 credits

▲ Concentration in School Psychology (SCH)
The School Psychology program is committed to preparing graduate students to practice psychology in educational and clinical settings that serve children, adolescents, and their families. The program employs an instructional model that combines a sound understanding of psychological theory and research with outstanding practicum and internship experiences. The curriculum imparts foundational knowledge in psychology, education, intervention and problem solving, statistics and research methodology, and professional school psychology, along with supervised experiences in educational and clinical settings.

Students admitted to the MA in psychology concentration in school psychology are expected to complete also the School Psychology Graduate Certificate. Students must apply for admission to both the master’s program concentration and the certificate. Students in the combined master's concentration-certificate program must complete a one-year full-time internship along with a 6-credit internship course during their third year of study: PSYC 790 - School Psychology Internship

Students who are admitted to the MA in psychology concentration in applied developmental psychology who wish also to pursue additional training in school psychology must apply for admission to the school psychology program. These students should consult with the director of the school psychology program to develop an individual program of study that fulfills the requirements for licensure or certification.

The MA concentration and graduate certificate make up a program designed to prepare graduates for professional practice in school psychology. The program is approved by School Psychology Training Programs of the National Association of School Psychologists (NASP). Students completing this concentration in the master’s degree and the certificate will be eligible for licensure in Virginia by the state Board of Education and certification or licensure in other states as a school psychologist. Certification or licensure as a school psychologist typically requires all course work for both the master’s degree and the certificate. (Students seeking licensure for independent practice as a school psychologist must meet the educational, residency, and exam requirements of the Commonwealth of Virginia Board of Psychology.)

Students in the school psychology concentration are required to enroll full time unless an alternative arrangement is made with the permission of the director of the concentration.

Non-Mason students enrolled in a school psychology training program at another institution who are completing an internship in the local area and wish to enroll in PSYC 790 - School Psychology Internship may do so by enrolling in nondegree status with approval by the director of the program.

The number of credits required for the concentration may be reduced by a maximum of 18 credits on the basis of graduate course work completed before admission with approval of the school psychology faculty, director of the graduate program, and dean.

Satisfactory Performance

Students pursuing combined master's concentration-certificate program must receive a minimum grade of 3.00 in each course. An unsatisfactory evaluation at any time by the School Psychology Committee may result in termination from the program.

One required counseling course (3 credits)

- EDCD 603 - Counseling Theories and Practice Credits: 3

One required EDSE course (3 credits) chosen from:

- EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum Credits: 3
- EDSE 629 - Secondary Curriculum and Strategies for Students with Disabilities who Access the General Curriculum Credits: 3
One course (3 credits) chosen from:

- PSYC 506 - Theories of Personality Credits: 3
- PSYC 669 - Social and Emotional Development Credits: 3
- PSYC 704 - Life-Span Development Credits: 3

Additional required psychology courses (37 credits):

- PSYC 592 - Special Topics Credits: 1-6 (when topic is Diversity)
- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4
- PSYC 617 - Child Psychopathology Credits: 3
- PSYC 619 - Applied Behavior Analysis: Principles, Procedures, and Philosophy Credits: 3
- PSYC 671 - Role and Function of the School Psychologist Credits: 3
- PSYC 673 - Prevention, Intervention, and Consultation in Schools Credits: 4
- PSYC 709 - The Measurement of Intelligence Credits: 4
- PSYC 710 - Psychological Assessment Credits: 4
- PSYC 750 - School Psychology Practicum I Credits: 1
- PSYC 722 - Advanced Child Assessment Credits: 4

Total: 46 credits

Graduate Certificate in School Psychology (15 credits)

All students completing the MA concentration in school psychology are expected to complete the Graduate Certificate in School Psychology.

Total for Concentration and Certificate in School Psychology: 61 credits

Master's Level Certificate

Aviation Psychology Graduate Certificate

Banner Code: LA-CERG-AVIP

Web: psychology.gmu.edu
This program of study is offered by the Department of Psychology.

For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in aviation psychology, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Three required courses (9 credits)

- PSYC 530 - Cognitive Engineering: Cognitive Science Applied to Human Factors Credits: 3
- PSYC 645 - Research Methods in Human Factors and Applied Cognition Credits: 3
- PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3 (when aviation-related topic is approved for this certificate by the program director)

Two elective courses (6 credits) chosen from:

- PSYC 597 - Directed Reading and Research Credits: 1-6 (when topic is approved for this certificate)
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3
- SYST 560 - Introduction to Air Traffic Control Credits: 3
- SYST 671 - Judgment and Choice Processing and Decision Making Credits: 3

Total: 15 credits

Cognitive Neuroscience Graduate Certificate

Banner Code: LA-CERG-CNEU

Web: psychology.gmu.edu

This program of study is offered by the Department of Psychology.

For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.

Application Requirements
Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in cognitive neuroscience, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Core courses (9 credits):

- PSYC 530 - Cognitive Engineering: Cognitive Science Applied to Human Factors Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3 (6 credits required when topic is relevant to cognitive neuroscience. This course is repeatable when the specific topic is different.)

One course (3 credits) chosen from:

- PSYC 527 - Introduction to Neurobiology Credits: 2
- PSYC 531 - Mammalian Neurobiology Credits: 3
- PSYC 556 - Chemistry and the Brain Credits: 3
- PSYC 558 - Neuronal Bases of Learning and Memory Credits: 3
- PSYC 559 - Behavioral Chemistry Credits: 3

Two elective courses (6 credits) chosen from:

PSYC 597 and 768 may be used to fulfill this requirement when the topic is relevant to the certificate with prior written approval of the program director.

- PSYC 702 - Biological Bases of Human Behavior Credits: 3
- PSYC 597 - Directed Reading and Research Credits: 1-6
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Total: 18 credits

School Psychology Graduate Certificate

Banner Code: LA-CERG-SCH

Web: psychology.gmu.edu

This program of study is offered by the Department of Psychology.

For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.
Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in school psychology see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Students pursuing this certificate must also complete the master’s degree in psychology with concentration in school psychology. Students must complete 15 credits with a minimum grade of 3.00 in each course. All coursework for the master’s degree must be completed before registering for the internship (PSYC 790).

One required course (3 credits) chosen from:

- PSYC 592 - Special Topics Credits: 1-6 (when topic is Developmental Assessment)
- PSYC 630 - Developmental Disabilities Credits: 3
- EDCD 608 - Group Processes and Analyses Credits: 4

Assessment practicum (4 credits)

- PSYC 751 - School Psychology Assessment Practicum II Credits: 2

Internship (6 credits)

- PSYC 790 - School Psychology Internship Credits: 3-6

Practicum (2 credits)

- PSYC 792 - Practicum in Developmental Psychology, Biopsychology, and School Psychology Credits: 1-6

Total: 15 credits

Usability Graduate Certificate
This program of study is offered by the Department of Psychology.

For policies governing all graduate degrees, see the Academic Policies chapter of this catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in usability, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Three core courses (9 credits)

- PSYC 530 - Cognitive Engineering: Cognitive Science Applied to Human Factors Credits: 3
- PSYC 645 - Research Methods in Human Factors and Applied Cognition Credits: 3
- PSYC 737 - Psychology of Human-Technology Interaction Credits: 3

Two elective courses (6 credits) chosen from:

- PSYC 597 - Directed Reading and Research Credits: 1-6 (when topic is approved for this certificate)
- PSYC 654 - Naturalistic Methods in Psychology Credits: 3
- PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3 (when topic is approved for this certificate)
- PSYC 737 - Psychology of Human-Technology Interaction Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3
- EDIT 526 - Web Accessibility and Design Credits: 3
- EDIT 571 - Tools for Visual/Graphic Design Credits: 1-3
- EDIT 705 - Instructional Design Credits: 3
- EDIT 773 - Human Computer Interface Design for Teaching and Learning Credits: 3

Total: 15 credits

Doctoral Degree
Psychology, PhD

Banner Code: LA-PHD-PSYC

Web: psychology.gmu.edu

The goal of the doctoral program is to train students in the principles and applications of psychology. The program provides knowledge of the basic content areas in psychology and practical experience in applying this knowledge to solving human problems in life, work, and school. The program offers the following concentrations: applied developmental psychology, cognitive and behavioral neuroscience, clinical psychology, human factors/applied cognition, and industrial/organizational psychology.

This program of study is offered by the Department of Psychology.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the PhD in psychology, see Application Requirements and Deadlines on the departmental web site.

Reduction of Credit

For students entering the doctoral program with a master’s degree, the number of credits required may be reduced by a maximum of 30 credits subject to the approval of the program faculty and the dean. Requests for reduction of credit are reviewed by a committee only after acceptance to the PhD program.

Core Courses

Core course requirements cover the basic subject matter identified by the profession as essential to doctoral training: biological bases of behavior, social bases of behavior, cognitive bases of behavior, individual behavior, and history of psychology.

Specialty Courses

The 700-, 800-, and 900-level courses provide doctoral candidates with greater depth of study in specific content areas.

Practica

The purpose of the practica is to provide a broad range of experiences in settings related to the students’ concentrations.

Advancement to Candidacy

To advance to candidacy, students must complete all core courses required by their the program. Students must also successfully complete and pass written and oral comprehensive exams.
Dissertation (12-24 credits)

The dissertation requirement is designed to demonstrate the student’s ability to apply psychological principles to research problems. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students apply to this degree a minimum of 3 credits of 998 and 3 credits of 999; they may apply a minimum 12 and a maximum of 24 dissertation credits (998 and 999 combined) to the degree. Because of the continuous registration policy, students may be required to register for additional credits of these courses.

Student Evaluation

Students in the doctoral program are evaluated on the basis of grades, comprehensive exams, research, and communication skills. In doctoral courses, A and B are the only acceptable grades. Students in the doctoral program must successfully complete comprehensive exams administered each year.

Degree Requirements

In addition to satisfying the requirements for all doctoral degrees, students must successfully complete 72–76 credits of required course work chosen in one of five concentrations. Each concentration consists of four educational components: core courses, upper-level specialty courses, supervised practica, and dissertation.

▲ Concentration in Applied Developmental Psychology (APD)

The applied developmental psychology concentration is concerned with enhancing developmental processes and preventing developmental disorders in individuals and families across the life span. It uses the knowledge base and methodologies of developmental science to assist the development of individuals who vary in cultural and ethnic backgrounds; economic and social opportunities; physical, social, emotional, and cognitive abilities; and conditions of living (e.g., families, neighborhoods, communities, and physical settings). The program’s emphasis is on child development (infancy, early childhood, middle childhood, and adolescence), and students may focus their studies on the cognitive, social, emotional, language, personality, or physiological aspects of development.

The applied developmental concentration has two goals: to train students to teach and do research on basic and applied issues in child development for employment in such settings as universities, research institutes, and organizations, and to train students to do applied work in developmental psychology (consultation, program evaluation, assessment and evaluation, developmental interventions, and parent training) in such settings as schools, hospitals, courts, child care facilities, and other organizations. Applied developmental psychology doctoral students have the option of also completing course requirements for the MA concentration in school psychology.

Students pursuing this concentration must complete 72 credits.

One course of developmental core (3 credits)

- PSYC 704 - Life-Span Development Credits: 3

Two courses of cognitive, biological, social, or historical core (6 credits) chosen from:
Cognitive

- PSYC 701 - Cognitive Bases of Behavior Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3 (except when this course is exclusively methodological)

Biological

- PSYC 702 - Biological Bases of Human Behavior Credits: 3
- PSYC 558 - Neuronal Bases of Learning and Memory Credits: 3
- PSYC 559 - Behavioral Chemistry Credits: 3

Social

- PSYC 703 - Social Bases of Behavior Credits: 3
- PSYC 667 - Behavior in Small Groups and Teams Credits: 3
- PSYC 668 - Personality: Theoretical and Empirical Approaches Credits: 3

Historical

- PSYC 705 - Historical and Philosophical Issues in Psychology Credits: 3

Quantitative Methods

Students must complete an approved Quantitative Methods Track from below:

Quantitative Emphasis Track (13 credits)

Two required courses (7 credits)

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 754 - Quantitative Methods III: Psychological Applications of Regression Techniques Credits: 3
Two courses (6 credits) chosen from:

- PSYC 557 - Psychometric Methods Credits: 3
- PSYC 646 - Issues and Methods in Longitudinal Developmental Research Credits: 3
- PSYC 652 - Quantitative Methods II: Analysis of Variance Credits: 3
- PSYC 756 - Quantitative Methods IV: Multivariate Techniques in Psychology Credits: 3
- PSYC 757 - Advanced Topics in Statistical Analysis Credits: 3 (with approval)
- PSYC 892 - Special Topics in Psychology Credits: 1-6 (with approval)

Traditional Track (11 credits)

Two required courses (8 credits)

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4

One course (3 credits) chosen from:

- PSYC 652 - Quantitative Methods II: Analysis of Variance Credits: 3
- PSYC 754 - Quantitative Methods III: Psychological Applications of Regression Techniques Credits: 3
- PSYC 756 - Quantitative Methods IV: Multivariate Techniques in Psychology Credits: 3
- PSYC 892 - Special Topics in Psychology Credits: 1-6 (with approval)

Two courses of Advanced Specialized Methods (6 credits)

One or two Research Methods courses (3-6 credits)

- PSYC 646 - Issues and Methods in Longitudinal Developmental Research Credits: 3
- PSYC 654 - Naturalistic Methods in Psychology Credits: 3

Up to one Specialized Methods course (0-3 credits)
- PSYC 619 - Applied Behavior Analysis: Principles, Procedures, and Philosophy Credits: 3
- PSYC 673 - Prevention, Intervention, and Consultation in Schools Credits: 4
- PSYC 684 - Psychological Counseling Techniques Credits: 3
- PSYC 709 - The Measurement of Intelligence Credits: 4
- PSYC 710 - Psychological Assessment Credits: 4
- PSYC 722 - Advanced Child Assessment Credits: 4
- PSYC 786 - Assessment and Treatment in Gerontology Credits: 3
- PSYC 794 - Developmental Assessment Credits: 1-6

Specialized content (15 credits):

One required course (3 credits)

- PSYC 669 - Social and Emotional Development Credits: 3

Four elective courses (12 credits) chosen from:

- PSYC 592 - Special Topics Credits: 1-6 (when topic is Early Childhood Education, Childcare, and the Transition to School)
- PSYC 614 - The Psychology of Aging Credits: 3
- PSYC 615 - Language Development Credits: 3
- PSYC 617 - Child Psychopathology Credits: 3
- PSYC 630 - Developmental Disabilities Credits: 3
- PSYC 648 - Developmental Psychopathology Credits: 3
- PSYC 666 - Cognitive and Perceptual Development Credits: 3
- PSYC 780 - Applied Developmental Psychology Credits: 3
- PSYC 892 - Special Topics in Psychology Credits: 1-6 (when topic is developmental)
- EDRS 631 - Program Evaluation Credits: 3

Professional seminar/professional ethics (3 credits)

Students take 1 credit in fall and 1 credit in spring of their first year and 1 additional credit at any other time (preferably in their second year).

- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Directed reading and research or practicum (8 credits)

Students may fulfill this requirement with 8 credits of PSYC 897 or a combination of 897 and 792.
- PSYC 897 - Directed Reading and Research Credits: 1-3 (can be repeated for credit)
- PSYC 792 - Practicum in Developmental Psychology, Biopsychology, and School Psychology Credits: 1-6 (A maximum of 6 credits may be applied to this requirement.)

**Elective courses**

Students complete the 72 credits required for the degree with elective courses, which may include credits of PSYC 897 over and above those used to fulfill the requirements above. Credits for MA thesis and proposal (PSYC 798, 799) may not be used as electives in the PhD program.

**Dissertation (12 credits):**

Students take at least 3 credits of 998 and 3 credits of 999.

- PSYC 998 - Doctoral Dissertation Proposal Credits: 1-6
- PSYC 999 - Doctoral Dissertation Credits: 1-9

**Total: 72 credits**

▲ **Concentration in Clinical Psychology (CLN)**

The clinical psychology concentration is committed to the clinical science model. Our goal is to train clinical psychologists who are capable of integrating research and applied clinical activities. The program is unique in approaching clinical psychology from social psychological and contextual perspectives. A social psychological approach uses theory and research from social psychology to understand emotional, cognitive, behavioral, and interpersonal functioning. A contextual perspective stresses the impact of social and cultural factors on the individual and vice versa. Most of the faculty members employ cognitive-behavioral and interpersonal approaches to research and clinical practice, but students also receive exposure to humanistic, existential, and psychodynamic perspectives.

Students pursuing this concentration must complete 76 graduate credits.

**One course (3 credits) of biological bases of behavior chosen from:**

- PSYC 558 - Neuronal Bases of Learning and Memory Credits: 3
- PSYC 559 - Behavioral Chemistry Credits: 3
- PSYC 685 - Cognitive Neuroscience Credits: 3
- PSYC 702 - Biological Bases of Human Behavior Credits: 3

**One course (3 credits) of developmental bases of behavior chosen from:**

- PSYC 666 - Cognitive and Perceptual Development Credits: 3
- PSYC 669 - Social and Emotional Development Credits: 3
- PSYC 704 - Life-Span Development Credits: 3
Three courses (11 credits) in research methods and analysis

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4
- PSYC 644 - Methods for Social Research Credits: 3

Ten required courses (41 credits):

- PSYC 810 - Psychological Assessment I Credits: 4
- PSYC 811 - Psychological Assessment II Credits: 4
- PSYC 822 - Scientific Foundations of Clinical Psychology I Credits: 3
- PSYC 830 - History, Systems, and Theories of Personality and Psychotherapy Credits: 3
- PSYC 833 - Social And Cognitive Foundations Of Clinical Psychology Credits: 3
- PSYC 860 - Introductory Helping Skills and Motivational Interviewing Credits: 3
- PSYC 861 - Cognitive Behavioral Therapy for Youth Credits: 3 (6 credits total)
  Students take 3 credits in fall and 3 credits in spring of the second year.
- PSYC 862 - Cognitive Behavioral Therapy for Adults Credits: 3 (6 credits total)
  Students take 3 credits in fall and 3 credits in spring of the second year.
- PSYC 881 - Practicum in Clinical Psychology Credits: 1-3 (6 credits total)
  Students take 3 credits in fall and 3 credits in spring of the third year.
- PSYC 883 - Ethical and Professional Issues in Clinical Practice Credits: 3

Two elective courses (6 credits)

Students choose electives in consultation with and with the approval of an advisor.

Dissertation (12 credits):

At least 3 credits of each.

- PSYC 998 - Doctoral Dissertation Proposal Credits: 1-6
- PSYC 999 - Doctoral Dissertation Credits: 1-9

Internship

Students complete a full-time, 12-month clinical psychology internship at a site accredited by the American Psychological Association.

Externship (optional, but recommended)

Students complete a part-time clinical psychology externship in the third or fourth year of the program.
Total: 76 credits

▲ Concentration in Cognitive and Behavioral Neuroscience (CBNR)

This concentration focuses on studying biological substrates of behavior. Core and affiliated faculty study areas as diverse as neural control of behavioral development; brain systems in substance abuse; animal models of learning and memory and their disorders (such as Alzheimer’s); human brain systems involved in cognition, perception, human error, decision making, and movement; the relation of neural activity to human performance; and cognitive aging. A focus of the program is on translational neuroscience-complementary study of neural systems in humans and animals, including application of animal research to human behavior.

The program’s core facilities have well-equipped behavioral testing and histological/histochemical facilities. The program’s strong links to the Krasnow Institute for Advanced Study and the Center for Biomedical Genomics and Informatics allows opportunities for collaborative work as diverse as tissue slice preparations and molecular genetics. The doctoral program prepares students for research-based careers in academics, government, or industry.

Students pursuing this concentration must complete 72 graduate credits.

Four courses of cognitive and behavioral neuroscience core (11 credits)

- PSYC 527 - Introduction to Neurobiology Credits: 2
- PSYC 531 - Mammalian Neurobiology Credits: 3
- PSYC 558 - Neuronal Bases of Learning and Memory Credits: 3
  or
- PSYC 685 - Cognitive Neuroscience Credits: 3
- PSYC 555 - Neuroimaging Credits: 3
  or
- PSYC 559 - Behavioral Chemistry Credits: 3

Four courses of quantitative and research methods (14 credits)

Two required courses (8 credits)

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4

One course in advanced statistics (3 credits) chosen from:
One elective methods course (3 credits)

Students choose a fourth course in quantitative or research methods in consultation with an advisor and with the approval of the program faculty. This can include the course not chosen to fulfill the requirement above.

Professional seminar (2 credits):

- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Research Credits (6 credits)

The research credit requirement can be met through completion of a master's thesis (recommended) or other research course as approved by the program.

Elective credits

Students can complete the 72 credit requirement through credits of additional coursework as approved by the program/advisor. 6 of these courses must be outside of the cognitive and behavioral neuroscience program.

Dissertation (12-24 credits):

Students take at least 3 credits of 998 and 3 credits of 999.

- PSYC 998 - Doctoral Dissertation Proposal Credits: 1-6
- PSYC 999 - Doctoral Dissertation Credits: 1-9

Total: 72 credits

▲ Concentration in Human Factors/Applied Cognition (HF)

The human factors and applied cognition concentration covers basic theoretical and empirical issues and emphasizes research that applies cognitive science to real-world problems. The program builds bridges between human factors engineering and cognitive psychology. Many applications of cognitive science are in the domain of human factors, and many doctoral students who complete our program go on to be human factors professionals.

Students pursuing this concentration must complete 72 graduate credits.

One course (3 credits) of cognitive core chosen from:
- PSYC 701 - Cognitive Bases of Behavior Credits: 3
- PSYC 759 - Applied Decision Making Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

Two courses of biological, social, developmental, or historical core (6 credits) chosen from:

**Biological**

- PSYC 558 - Neuronal Bases of Learning and Memory Credits: 3
- PSYC 559 - Behavioral Chemistry Credits: 3
- PSYC 685 - Cognitive Neuroscience Credits: 3
- PSYC 702 - Biological Bases of Human Behavior Credits: 3

**Social**

- PSYC 667 - Behavior in Small Groups and Teams Credits: 3
- PSYC 668 - Personality: Theoretical and Empirical Approaches Credits: 3
- PSYC 703 - Social Bases of Behavior Credits: 3

**Developmental**

- PSYC 666 - Cognitive and Perceptual Development Credits: 3
- PSYC 669 - Social and Emotional Development Credits: 3
- PSYC 704 - Life-Span Development Credits: 3

**Historical**

- PSYC 705 - Historical and Philosophical Issues in Psychology Credits: 3

Two courses (8 credits) of quantitative and research methods:

- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 612 - Advanced Statistics Credits: 4
Three courses (9 credits) of advanced statistics or qualitative methods

- PSYC 754 - Quantitative Methods III: Psychological Applications of Regression Techniques Credits: 3
- PSYC 756 - Quantitative Methods IV: Multivariate Techniques in Psychology Credits: 3
- PSYC 757 - Advanced Topics in Statistical Analysis Credits: 3

Two courses of specialized content (6 credits)

- PSYC 530 - Cognitive Engineering: Cognitive Science Applied to Human Factors Credits: 3
- PSYC 645 - Research Methods in Human Factors and Applied Cognition Credits: 3

Three courses (9 credits) of additional specialized content

These are seminars with variable topics that may be repeated for credit when the topic is different.

- PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3
- PSYC 737 - Psychology of Human-Technology Interaction Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3

One course (3 credits) of special topics in professional issues:

- PSYC 890 - Seminar in Professional Psychology Credits: 1-3

Directed reading and research

Students are encouraged to take a minimum of 1 credit of this course each semester.

- PSYC 897 - Directed Reading and Research Credits: 1-3

Elective courses

Students have several options for completing the remaining 72 credits required for the degree. They may take additional content courses, including the variable topics seminars 734, 737, or 768, or they may take 3 to 6 credits of Practicum - PSYC 730 with permission of their advisor. Students who do not have work experience in applied cognition or human factors are encouraged to take up to 6 credits of practicum.

Students are strongly encouraged to develop competence in programming and computer science through course work or independent study. Students are also encouraged to identify and take relevant courses within or outside the department with permission of their advisor.

Some options for fulfilling this requirement:
- PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3
- PSYC 737 - Psychology of Human-Technology Interaction Credits: 3
- PSYC 768 - Advanced Topics in Cognitive Science Credits: 3
- PSYC 730 - Practicum in Applied Psychology Credits: 1-6

Dissertation (12 credits):

Students take at least 3 credits of 998 and 3 credits of 999.

- PSYC 998 - Doctoral Dissertation Proposal Credits: 1-6
- PSYC 999 - Doctoral Dissertation Credits: 1-9

Total: 72 credits

▲ Concentration in Industrial/Organizational Psychology (IO)

The industrial/organizational psychology concentration focuses on multiple aspects of behavior in organizational settings, including personnel selection, quantitative analysis, teams, leadership, work and family issues, and organizational health issues. Mason’s graduate work in this area emphasizes research as the key to knowledge in both academic and applied settings. The program fosters a peer-oriented environment whereby students collaborate on numerous projects in addition to working with faculty members, in many different areas of industrial/organizational psychology.

Students pursuing this concentration must complete 72 graduate credits.

One core course (3 credits) chosen from:

- PSYC 703 - Social Bases of Behavior Credits: 3

Six required courses (19 credits) in statistics

- PSYC 557 - Psychometric Methods Credits: 3
- PSYC 611 - Advanced Statistics Credits: 4
- PSYC 633 - Evaluative Research in Psychology Credits: 3
- PSYC 754 - Quantitative Methods III: Psychological Applications of Regression Techniques Credits: 3
- PSYC 892 - Special Topics in Psychology Credits: 1-6
- One additional specialized statistics course [such as PSYC 756 or PSYC 646 or 892 (not SEM/META)] Credits: 3

Four courses (12 credits) in survey of content
- PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
- PSYC 636 - Survey of Industrial Psychology Credits: 3
- PSYC 639 - Survey of Organizational Processes Credits: 3
- PSYC 739 - Seminar in Industrial/Organizational Psychology Credits: 3

Five courses (15 credits) of specialized content

- PSYC 638 - Training: Psychological Contributions to Theory, Design, and Evaluation Credits: 3
- PSYC 667 - Behavior in Small Groups and Teams Credits: 3
- PSYC 733 - Issues in Personnel Psychology Credits: 3
- PSYC 741 - Psychology of Work Motivation Credits: 3
- PSYC 892 - Special Topics in Psychology Credits: 1-6

At least 9 credits of professional development

Required:

- PSYC 890 - Seminar in Professional Psychology Credits: 1-3 (3 credits required)
- PSYC 892 - Special Topics in Psychology Credits: 1-6 (6 credits required)

Recommended:

- PSYC 730 - Practicum in Applied Psychology Credits: 1-6
  And/or
- PSYC 897 - Directed Reading and Research Credits: 1-3

Electives

Students complete the remaining credits required for this degree through additional course work in professional development or dissertation.

Dissertation (12 credits)

Students take at least 3 credits of 998 and 3 credits of 999.

- PSYC 998 - Doctoral Dissertation Proposal Credits: 1-6
Public and International Affairs

Phone: 703-993-1400
Web: pia.gmu.edu

Faculty

Robinson Professors: Heclo, Paden, Pearlstein

Emeritus faculty: Brown, Clark, Gortner, Hart-Nibbrig, Knight, White

Professors: Abramson, Conant, Conlan, Druckman, Dudley, Katz, Mahler, McFerson, Posner, Regan (chair), Sockett, Wan, Wilsford

Associate professors: Balint, Benjamin, Burt, Dueck, Hackler, Harbour, Lukaes, Mandaville, McDonald, McGlinchey, Miller, Nguyen, Sacco, Thrall, Toepler, Travis

Assistant professors: Daigle, Haddad, Koblentz, Lopez-Santana, McGrath, Ouaghrham-Gormley, Robbins

Term faculty: Burroughs, Edner, Ericson, Ludwick, Walker


Affiliate faculty: Annpurna, Bernardi, Bushee, Connolly, Farnsworth, Gandhi, Goerl, Healy, Hoagland, Loonsk, Marshall, Mendis, O’Neil, Peake, Shogan, Teachenko

Course Work

The Public and International Affairs Department offers all course work designated BIOD, GOVT, and PUAD in the Courses chapter of this catalog.

Undergraduate Programs

The department offers two degrees for students interested in political science, government, and international relations: a BA in government and international politics and a BS in public administration. Majors in government and international politics take core courses in American political institutions, the political systems of other countries, and international relations. Students can focus their electives to earn a concentration in American politics, international politics, political theory and law, or public policy. Majors in public administration take courses in government, management, policy, and administration. Concentrations are offered in administration and management, public policy, nonprofit management, US government institutions, and administration and economics.
Students have an opportunity to do internships as part of their degree programs, gaining valuable work experience while earning college credit.

**Honors in the Major**

Highly qualified students majoring in government and international politics and public administration may pursue advanced work leading to graduation with honors in the major. Those students selected for participation in this program take a two-course sequence GOVT 491 and 496. To graduate with honors in the major, students must complete these courses with a minimum GPA of 3.50.

**Minors**

The department offers minors in American government, international/comparative studies, legal studies, and public policy and management. In addition, faculty from the department coordinate or participate in the Asia-Pacific Studies Minor, Global Systems Minor, Middle East Studies Minor, Islamic Studies Minor, and Urban and Suburban Studies Minor. It participates with the Philosophy Department in the Political Philosophy Minor. See the Minors and Interdisciplinary Minors section of this chapter.

**Bachelor's/Accelerated Master's Programs**

The department offers highly qualified undergraduates the opportunity to apply to an accelerated master’s degree program in political science or public administration. If accepted, students will be able to earn both an undergraduate and a graduate degree after satisfactory completion of 150 credits, sometimes within five years.

**Graduate Programs**

The department offers masters and doctoral programs in biodefense and political science. The department also offers a master of public administration (MPA), in which students can focus their electives to earn a concentration in administration of justice, emergency management and homeland security, environmental science and public policy, human resources management, international management, nonprofit management, policy studies, public management, public and nonprofit finance, state and local government, or third-party governance.

**Funding**

The department offers teaching and research assistantships, which are awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students awarded assistantships must register for a minimum of six credits a semester and show satisfactory progress toward their degree.

**Certificate Programs**

The department offers six graduate certificates. Students may pursue a certificate as a stand alone program or as part of another graduate degree. They must apply for admission to the certificate program and meet the admission standards set for degree-seeking graduate students in the department.

**Master’s International (MI)**
Graduate students can take advantage of Master’s International (MI), a joint program between Mason and the Peace Corps, which enables participants to combine Peace Corps volunteer service with the master's degrees in political science or public administration. See the degree programs below for more details.

**Undergraduate Degree**

**Government and International Politics, BA**

**Banner Code:** LA-BA-GVIP

Web: pia.gmu.edu

This program of study is offered by the Department of Public and International Affairs.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

**Degree Requirements**

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in government and international politics must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences.

Students pursuing this degree must complete 43 credits in GOVT and earn a minimum grade of 2.00 in each course applied to the major.

**Five core courses (16 credits)**

- GOVT 101 - Democratic Theory and Practice Credits: 3
- GOVT 103 - Introduction to American Government Credits: 3
- GOVT 132 - Introduction to International Politics Credits: 3
- GOVT 133 - Introduction to Comparative Politics Credits: 3
- GOVT 300 - Research Methods and Analysis Credits: 4

**One senior seminar (3 credits) chosen from:**

- GOVT 490 - Synthesis Seminar Credits: 3
- GOVT 491 - Honors Seminar Credits: 3

This option is for students who have been accepted to pursue honors in the major.

**Government Field Study (24 credits)**
Students complete the degree by taking eight advanced government field courses (24 credits), with or without concentration. Students may complete a concentration (five courses) in one field, then complete one course in each of the remaining fields to satisfy this requirement. Students who do not pursue a concentration may choose 24 credits from the advanced government field courses listed below (with restriction) for a broader learning experience.

All students must take at least one course (3 credits) from each of the lists of advanced field courses.

Concentrations (0-15 credits)

Students may partially satisfy the field focus requirement by completing five courses (15 credits) in any one (1) approved concentration as described below.

Students pursuing a concentration will complete the degree by taking one courses (3 credits) in each of the remaining three fields, chosen from the lists of advanced field courses shown below, to complete a total of 24 credits of field courses.

GOVT 490 may not be used to fulfill a requirement for a concentration.

▲Concentration in American Politics

Five courses (15 credits) chosen from:

- GOVT 301-319
- GOVT 401-419

▲Concentration in Political Theory and Law

Five courses (15 credits) chosen from:

- GOVT 320 - 329
- GOVT 420 - 429
- GOVT 446
- GOVT 470-472

▲Concentration in International and Comparative Politics

Five courses (15 credits) chosen from:

- GOVT 330 - 349
- GOVT 430 - 449

▲Concentration in Public Policy and Administration

Five courses (15 credits) chosen from:

- GOVT 350 - 369
- GOVT 450 - 469

Advanced government field courses (9-24 credits)
Students may complete the degree without concentration by taking eight courses (24 credits) of advanced field courses, to include at least one course (3 credits) from each of the four government fields listed below.

Up to 3 credits of GOVT 480 may be used to fulfill this requirement with prior approval of the internship coordinator. Up to 6 credits of 496 may be used to fulfill this requirement with prior approval of the instructor and chair. GOVT 490 may not be used to fulfill this requirement.

Students who are pursuing a concentration in one field must take at least one course from each of the other three fields to complete the degree.

### Public policy and administration

- GOVT 351 - Administration in the Political System Credits: 3
- GOVT 353 - Social Entrepreneurship Credits: 3
- GOVT 354 - Third-Party Government and the Nonprofit Sector Credits: 3
- GOVT 355 - Public Personnel Administration Credits: 3
- GOVT 356 - Public Budgeting and Finance Credits: 3
- GOVT 357 - Urban Governance and Planning Credits: 3
- GOVT 358 - Nonprofit Financial Planning Credits: 4
- GOVT 359 - Computers in Public Management Credits: 3
- GOVT 361 - Introduction to Environmental Policy Credits: 3
- GOVT 364 - Public Policy Making Credits: 3
- GOVT 365 - State and Regional Public Policy Credits: 3
- GOVT 366 - Public Policy Analysis Credits: 3
- GOVT 367 - Money, Markets and Economic Policy Credits: 3
- GOVT 452 - Administrative Law and Procedures Credits: 3
- GOVT 460 - Surveillance and Privacy in Contemporary Society Credits: 3
- GOVT 464 - Issues in Public Policy and Administration Credits: 1-3

### American politics

- GOVT 301 - Public Law and the Judicial Process Credits: 3
- GOVT 302 - American Political Development Credits: 3
- GOVT 304 - American State and Local Government Credits: 3
- GOVT 305 - Contemporary American Federalism Credits: 3
- GOVT 307 - Legislative Behavior Credits: 3
- GOVT 308 - The American Presidency Credits: 3
- GOVT 309 - Government and Politics of Metropolitan Areas Credits: 3
- GOVT 311 - Public Opinion and Electoral Behavior Credits: 3
- GOVT 312 - Political Parties and Campaigns Credits: 3
- GOVT 318 - Interest Groups, Lobbying, and the Political Process Credits: 3
- GOVT 319 - Issues in Government and Politics Credits: 1-3
- GOVT 407 - Law and Society Credits: 3
- GOVT 409 - Virginia Government and Politics Credits: 3
- GOVT 412 - Politics and the Mass Media Credits: 3
- GOVT 414 - Politics of Race and Gender Credits: 3

**Political theory and law**

- GOVT 322 - International Relations Theory Credits: 3
- GOVT 323 - Classical Western Political Theory Credits: 3
- GOVT 324 - Modern Western Political Theory Credits: 3
- GOVT 327 - Contemporary Western Political Theory Credits: 3
- GOVT 328 - Non-Western Political Theory Credits: 3
- GOVT 329 - Issues in Political Theories and Values Credits: 1-3
- GOVT 420 - American Political Thought Credits: 3
- GOVT 421 - Contemporary Political Ideologies Credits: 3
- GOVT 422 - Constitutional Interpretation Credits: 3
- GOVT 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
- GOVT 424 - Constitutional Law: Criminal Process and Rights Credits: 3
- GOVT 427 - Feminist Political Thought Credits: 3
- GOVT 428 - Advanced Democratic Theory Credits: 3
- GOVT 470 - Faith and Reason in the Making of the Modern Mind Credits: 3
- GOVT 471 - Millennialism and Philosophies of History in Western Culture Credits: 3
- GOVT 472 - Christianity, Secularism, and Democracy Credits: 3

**International and comparative politics**

- GOVT 331 - Government and Politics of Latin America Credits: 3
- GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3
- GOVT 333 - Government and Politics of Asia Credits: 3
- GOVT 334 - Government and Politics of Europe Credits: 3
- GOVT 336 - Political Development and Change Credits: 3
- GOVT 337 - Ethnic Politics in Western Europe and North America Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
- GOVT 339 - Issues in the Politics of Advanced Industrial Societies Credits: 1-3
- GOVT 340 - Central Asian Politics Credits: 3
- GOVT 341 - Chinese Foreign Policy Credits: 3
- GOVT 342 - Diplomacy Credits: 3
- GOVT 343 - International Political Economy Credits: 3
- GOVT 344 - American Foreign Policy Credits: 3
- GOVT 345 - Political Islam Credits: 3
- GOVT 346 - American Security Policy Credits: 3
- GOVT 347 - International Security Credits: 3
- GOVT 430 - Comparative Political Leadership Credits: 3
- GOVT 432 - Political Change and Social Development in Sub-Saharan Africa Credits: 3
- GOVT 433 - Political Economy of East Asia Credits: 3
- GOVT 434 - Democracy in Global Perspective Credits: 3
- GOVT 443 - Law and Ethics of War Credits: 3
- GOVT 444 - Issues in International Studies Credits: 1-3
- GOVT 445 - Human Rights Credits: 3
- GOVT 446 - International Law and Organization Credits: 3
- GOVT 447 - Revolution and International Politics Credits: 3
- GOVT 448 - Ethics and International Politics Credits: 3

Total: 43 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors. Students majoring in government and international politics may fulfill this requirement by successfully completing GOVT 490 or GOVT 491 in their major programs.

Public Administration, BS

Banner Code: LA-BS-PUAD

Web: pia.gmu.edu

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BS in public administration must complete additional college requirements for the BS degree in the College of Humanities and Social Sciences.

Students must earn a minimum grade of 2.00 in each course applied to the major, including GOVT courses as well as the supporting courses in other disciplines used to fulfill the requirements below. With careful planning, some courses required for the major may also fulfill university general education requirements. See an advisor before registering.

Eight core courses (25 credits)

- GOVT 101 - Democratic Theory and Practice Credits: 3
- GOVT 103 - Introduction to American Government Credits: 3
- GOVT 132 - Introduction to International Politics or GOVT 133 - Introduction to Comparative Politics Credits: 3
- GOVT 300 - Research Methods and Analysis Credits: 4
- GOVT 351 - Administration in the Political System Credits: 3
ECON 103 - Contemporary Microeconomic Principles Credits: 3
ECON 104 - Contemporary Macroeconomic Principles Credits: 3
One course (3 credits) in math or statistics

One senior seminar (3 credits) chosen from:

- GOVT 490 - Synthesis Seminar Credits: 3
- GOVT 491 - Honors Seminar Credits: 3

Public Administration Field Study (minimum of 24 credits)

Students complete the degree by taking a minimum of 24 credits of advanced public administration field courses, with or without concentration. Students may complete a concentration of at least 15 credits in one field, then earn a minimum of 9 additional credits by taking courses in three of the four remaining fields to satisfy this requirement. Students who do not wish to pursue a concentration may choose at least 24 credits from the advanced public administration courses listed below (with restrictions noted below) for a broader learning experience.

Concentrations (0-15 credits)

Students may partially satisfy the field focus requirement by completing at least 15 credits in any one (1) approved concentration as described below.

Students pursuing a concentration will complete the degree by taking one course (3-4 credits) in three of the remaining four fields, chosen from the lists of advanced field courses shown below, to complete a minimum of 24 credits of field courses.

▲ Concentration in Administration and Management (ADMM)

Five courses (at least 15 credits) chosen from the list of administration and management field courses below.

▲ Concentration in Public Policy (PUBP)

Five courses (15 credits) chosen from the list of public policy field courses below.

▲ Concentration in Nonprofit Management (NPMG)

Five courses (at least 15 credits) chosen from the list of nonprofit management field courses below.

▲ Concentration in US Government Institutions (USGI)

Five courses (15 credits) chosen from the list of US government institutions field courses below

▲ Concentration in Administration and Economics (ADME)

Five courses (15 credits) chosen from the list of administration and economics field courses below
Advanced public administration field courses (9-24 credits)

Students complete the degree by taking at least 24 credits of advanced government field courses. One course (3 credits) from each of the lists of advanced field courses below must be included (total 15 credits). Students who do not pursue a formal concentration may choose from all five lists of field courses to complete the remaining 9 credits.

Up to 3 credits of GOVT 480 may be used to fulfill the field course requirement with prior approval of the internship coordinator. Up to 6 credits of GOVT 496 may be used to fulfill this requirement with prior approval of the advisor. GOVT 490 may NOT be used to fulfill this requirement.

Administration and Management

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOVT 305 - Contemporary American Federalism</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 355 - Public Personnel Administration</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 356 - Public Budgeting and Finance</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 358 - Nonprofit Financial Planning</td>
<td>4</td>
</tr>
<tr>
<td>GOVT 359 - Computers in Public Management</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 367 - Money, Markets and Economic Policy</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 452 - Administrative Law and Procedures</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 464 - Issues in Public Policy and Administration</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Public Policy

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOVT 312 - Political Parties and Campaigns</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 318 - Interest Groups, Lobbying, and the Political Process</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 346 - American Security Policy</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 347 - International Security</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 361 - Introduction to Environmental Policy</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 364 - Public Policy Making</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 366 - Public Policy Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 412 - Politics and the Mass Media</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 464 - Issues in Public Policy and Administration</td>
<td>1-3</td>
</tr>
<tr>
<td>ECON 309 - Economic Problems and Public Policies</td>
<td>3</td>
</tr>
<tr>
<td>ECON 335 - Environmental Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

Nonprofit Management

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOVT 353 - Social Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 354 - Third-Party Government and the Nonprofit Sector</td>
<td>3</td>
</tr>
<tr>
<td>GOVT 358 - Nonprofit Financial Planning</td>
<td>4</td>
</tr>
<tr>
<td>NCLC 331 - The Nonprofit Sector</td>
<td>4</td>
</tr>
</tbody>
</table>
• NCLC 431 - Principles of Fund Raising Credits: 4
• ECON 355 - The Political Economy of Nonprofit Institutions Credits: 3

US Government Institutions

• GOVT 301 - Public Law and the Judicial Process Credits: 3
• GOVT 302 - American Political Development Credits: 3
• GOVT 304 - American State and Local Government Credits: 3
• GOVT 305 - Contemporary American Federalism Credits: 3
• GOVT 307 - Legislative Behavior Credits: 3
• GOVT 308 - The American Presidency Credits: 3
• GOVT 309 - Government and Politics of Metropolitan Areas Credits: 3
• GOVT 311 - Public Opinion and Electoral Behavior Credits: 3
• GOVT 409 - Virginia Government and Politics Credits: 3

Administration and Economics

• GOVT 367 - Money, Markets and Economic Policy Credits: 3
• ECON 309 - Economic Problems and Public Policies Credits: 3
• ECON 310 - Money and Banking Credits: 3
• ECON 320 - Labor Problems Credits: 3
• ECON 335 - Environmental Economics Credits: 3
• ECON 355 - The Political Economy of Nonprofit Institutions Credits: 3

Total: 52 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors. Students majoring in public administration may fulfill this requirement by successfully completing GOVT 490 or GOVT 491 in their major programs.

Undergraduate Interdisciplinary Minor

Global Systems Minor

Banner Code: GLOS
Global systems have become increasingly important to the way we live and work, and a global perspective makes us more aware of how we are connected to others around the world and to the whole of nature.

The interdisciplinary minor in global systems is designed to complement virtually any undergraduate major. It works well for majors in business disciplines, economics, languages, geography, government and international politics, history, and other disciplines that take a global view. Students in professional programs learn to connect their professional concerns to global issues of health care, trade and finance, or technology. Students in the liberal arts gain insights into their disciplines as they learn how the arts, humanities, sciences, and social sciences are affected by global issues such as demographic change, telecommunications, and environmental protection.

Other globally oriented courses may also fulfill or substitute for the requirements of this program with written permission of the coordinator prior to registration.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of the catalog.

Course Work

Students pursuing this minor must complete 18 credits with a minimum GPA of 2.00. At least 9 credits must be at the 300 level or above.

One required course (3 credits) chosen from:

- GLOA 101 - Introduction to Global Affairs Credits: 3
- GOVT 132 - Introduction to International Politics Credits: 3
- HIST 130 - History of the Modern Global System Credits: 3

Five elective courses (15 credits) chosen from at least two of the following fields:

Other globally-oriented courses may also be applied to this requirement with written approval of the director.

Field A: Government, geography, and administration of justice

- GOVT 132 - Introduction to International Politics Credits: 3
- GOVT 444 - Issues in International Studies Credits: 1-3
- CRIM 405 - Law and Justice around the World Credits: 3
- GGS 101 - Major World Regions Credits: 3
- GGS 301 - Political Geography Credits: 3
- GGS 303 - Conservation of Resources and Environment Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
Field B: Economics, anthropology, marketing, history, and sociology

- ANTH 300 - Civilizations Credits: 3
- ANTH 312 - Political Anthropology Credits: 3
- ANTH 331 - Refugees Credits: 3
- ANTH 375 - Culture, Power, History Credits: 3
- ECON 360 - Economics of Developing Areas Credits: 3
- ECON 361 - Economic Development of Latin America Credits: 3
- ECON 380 - Economies in Transition Credits: 3
- ECON 390 - International Economics Credits: 3
- HIST 125 - Introduction to World History Credits: 3
- HIST 130 - History of the Modern Global System Credits: 3
- HIST 387 - Topics in Global History Credits: 3
- MKTG 407 - International Marketing Credits: 3
- SOCI 332 - The Urban World Credits: 3

Field C: Environmental science, global health, systems engineering, urban and suburban studies, civil and infrastructure engineering

- BIOL 377 - Applied Ecology Credits: 3
- CEIE 100 - Environmental Engineering around the World Credits: 3
- CEIE 450 - Environmental Engineering Systems Credits: 3
- GCH 543 - Global Health Credits: 3
- USST 301 - Urban Growth in a Shrinking World Credits: 3

Field D: Modes of communication

- COMM 305 - Foundations of Intercultural Communication Credits: 3
- COMM 456 - Comparative Mass Media Credits: 3
- DANC 118 - World Dance Credits: 3
- MUSI 103 - Musics of the World Credits: 3
- MUSI 431 - Music History in Society III Credits: 3
- THR 359 - World Stages Credits: 3

Total: 18 credits

Middle East Studies Minor

Banner Code: MES
Today, more than ever before, Middle East politics has become intertwined with American politics and the lives of many Americans. The minor in Middle East studies is designed to equip undergraduates with a firm multidisciplinary grounding in the region, its history, and its international relations.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

In partial fulfillment of coursework for the minor, students are strongly encouraged to participate in a study abroad program in the Middle East.

Students pursuing this minor must complete 18 credits of coursework with a minimum GPA of 2.0.

Two core courses (6 credits)

- HIST 282 - Survey of Middle Eastern Civilization Credits: 3
- GOVT 332 - Government and Politics of the Middle East and North Africa Credits: 3

Four elective courses (12 credits) chosen from:

One course in a relevant language may be used as an elective. Other courses including ANTH 399 or CONF 399, when topic is relevant to the Middle East, may be used as electives with the prior written approval of the director.

- ARAB 325 - Major Arab Writers/Stories Credits: 3
- ARAB 330 - Reading and Conversation I Credits: 3
- ARAB 331 - Reading and Conversation II Credits: 3
- ANTH 330 - Peoples and Cultures of Selected Regions: Non-Western Credits: 3 (if region studied is relevant to Middle East studies)
- ARTH 319 - Art and Archaeology of the Ancient Near East Credits: 3
- ARTH 320 - Art of the Islamic World Credits: 3
- CONF 340 - Global Conflict Analysis and Resolution Credits: 3
- ENGH 362 - Global Voices Credits: 3 (if literatures studied are relevant to Middle East studies)
- GGS 325 - Geography of North Africa and the Middle East Credits: 3
- GOVT 328 - Non-Western Political Theory Credits: 3
- GOVT 345 - Political Islam Credits: 3
- GOVT 445 - Human Rights Credits: 3
- HIST 281 - Survey of Middle Eastern Civilization Credits: 3
- HIST 387 - Topics in Global History Credits: 3 (if region studied is relevant to Middle East studies)
- HIST 460 - Modern Iran Credits: 3
- HIST 461 - Arab-Israeli Conflict Credits: 3
- HIST 462 - Women in Islamic Society Credits: 3
- HIST 465 - The Middle East in the 20th Century Credits: 3
- RELI 211 - Religions of the West Credits: 3
- RELI 272 - Islam Credits: 3
- RELI 374 - Islamic Thought Credits: 3
- RELI 375 - Qur'an and Hadith Credits: 3

Total: 18 credits

Urban and Suburban Studies Minor

Banner Code: USSD

Phone: 703-993-1418

Faculty

Clapsaddle, Gifford, Hackler, Haynes, Hysom, Mattusch, Samara, Schintler, Schrag, Sockett, Stough, Todd, Travis, Wong

The program offers all course work designated USST in the Courses chapter of this catalog.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits of coursework with a minimum GPA of 2.00.

Three core courses (9 credits)

- USST 301 - Urban Growth in a Shrinking World Credits: 3
- USST 390 - Special Topics in Urban and Suburban Studies Credits: 3
- USST 401 - Seminar: The Future of Metropolitan America Credits: 3

Three elective courses (9 credits)
Students choose courses from a list of approved electives, which must be selected from more than one of the following categories: environment and culture, government and policy, and economy. Consult the director for a list of approved courses in each category.

Total: 18 credits

Undergraduate Minor

American Government Minor

Banner Code: AMGV

Web: pia.gmu.edu

The minor in American government develops knowledge of the principles, institutions, and behaviors of the American political system.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits in government with a minimum grade of 2.0 in each course.

One core course (3 credits):

- GOVT 103 - Introduction to American Government Credits: 3

Five elective courses (15 credits) chosen from:

- Any course on political institutions: GOVT 301–309
- Any course on political behavior GOVT 310–319
- Any course from GOVT 409–420
- GOVT 344 - American Foreign Policy Credits: 3
- GOVT 480 - Internship Credits: 3
  (When topic is relevant, 3 credits of GOVT 480 may be applied to the minor with approval of the minor advisor.)

Total: 18 credits
International/Comparative Studies Minor

Banner Code: ICS

Web: pia.gmu.edu

This minor increases students’ awareness of the regions and current issues of the world on theoretical and practical levels.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits in government with a minimum grade of 2.0 in each course.

One core course (3 credits) chosen from:

- GOVT 132 - Introduction to International Politics Credits: 3
- GOVT 133 - Introduction to Comparative Politics Credits: 3

Five elective courses (15 credits) chosen from:

- GOVT 103 - Introduction to American Government Credits: 3
- Any GOVT 330–339 comparative politics
- Any GOVT 340–349 international studies
- Any GOVT 430–439 comparative politics
- Any GOVT 440–449 international studies
- GOVT 480 - Internship Credits: 3 (when relevant, with the prior written approval of the minor advisor)

Total: 18 credits

Legal Studies Minor

Banner Code: LGLS

Web: pia.gmu.edu

The minor in legal studies focuses on the constitutional foundations, interpretation, processes, and functions of domestic and international law.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all minors, see the Academic Policies chapter of this catalog.
Course Work

Students pursuing this minor must complete 18 credits in government with a minimum grade of 2.0 in each course.

Two core courses (6 credits)

- GOVT 103 - Introduction to American Government Credits: 3
- GOVT 301 - Public Law and the Judicial Process Credits: 3

Four elective courses (12 credits) chosen from:

GOVT 480 - Internship Credits: 3, when relevant, may be used to partially meet this requirement with prior written approval of the minor advisor.

- GOVT 307 - Legislative Behavior Credits: 3
- GOVT 414 - Politics of Race and Gender Credits: 3
- GOVT 420 - American Political Thought Credits: 3
- GOVT 422 - Constitutional Interpretation Credits: 3
- GOVT 423 - Constitutional Law: Civil Rights and Liberties Credits: 3
- GOVT 424 - Constitutional Law: Criminal Process and Rights Credits: 3
- GOVT 446 - International Law and Organization Credits: 3
- GOVT 452 - Administrative Law and Procedures Credits: 3

Total: 18 credits

Public Policy and Management Minor

Banner Code: PPMG

Web: pia.gmu.edu

This minor introduces students to the theory and process of policy formulation and implementation in the political and governmental arena.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits in government with a minimum grade of 2.0 in each course.
Two core courses (6 credits)

- GOVT 103 - Introduction to American Government Credits: 3
- GOVT 351 - Administration in the Political System Credits: 3

Four elective courses (12 credits) chosen from:

- GOVT 350–359 public administration
- Any GOVT 360–369 public policy
- Any GOVT 450–459 public administration
- Any GOVT 460–469 public policy
- GOVT 480 - Internship, when relevant, with the prior written approval of the minor advisor

Total: 18 credits

Bachelor's/Accelerated Master's Program

Government and International Politics, BA/Political Science, Accelerated MA

Web: pia.gmu.edu

Highly qualified Mason students doing a BA in government and international politics may apply to the accelerated master's degree program. If accepted, students will be able to earn both the BA and an MA in political science after satisfactory completion of 150 credits.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated master’s in political science, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester
indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

**Government and International Politics, BA/Public Administration, Accelerated MPA**

*Web:* pia.gmu.edu

Highly qualified Mason students doing a BA in government and international politics may apply to the accelerated master's degree program. If accepted, students will be able to earn the BA and the MPA after satisfactory completion of 150 credits.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MPA, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

**Reserve Graduate Credit**
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To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

**Public Administration, BS/Political Science, Accelerated MA**

Web: pia.gmu.edu

Highly qualified Mason students doing a BA in government and international politics may apply to the accelerated master's degree program. If accepted, students will be able to earn both the BA and an MA in political science after satisfactory completion of 150 credits.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in political science, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

**Public Administration, BS/Public Administration, Accelerated MPA**
Highly qualified Mason students doing a BS in public administration may apply to the accelerated master's degree program. If accepted, students will be able to earn the BS and the MPA after satisfactory completion of 150 credits.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in public administration, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

Master's Degree

Biodefense, MS

Banner Code: LA-MS-BIOD

Web: pia.gmu.edu

The master's degree in biodefense prepares students to become the next generation of biodefense and biosecurity professionals and scholars. This program provides students with a foundation in microbiology and biotechnology combined with a broader security and organizational context.
This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MS in biodefense, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

Students are strongly encouraged to take the core courses as early as possible because they provide the foundation for the rest of the program. The schedule of courses that students plan on taking should be approved in an education plan designed by the students and their advisor during the student’s first semester. Students must receive the permission of their advisor to take courses outside of the Biodefense Program.

**Six core courses (18 credits)**

- BIOD 604 - Introduction to Biodefense I: Bacterial and Toxin Agents Credits: 3
- BIOD 605 - Introduction to Biodefense II: Viral Agents Credits: 3
- BIOD 609 - Biodefense Strategy and Policy Credits: 3
- GOVT 500 - The Scientific Method and Research Design Credits: 3
- GOVT 540 - International Relations Credits: 3
- PUAD 630 - Emergency Planning and Preparedness Credits: 3

**Four to five elective courses (12-15 credits)**

Students who choose to complete a thesis have 12 credits of electives. Students who choose to complete a project have 15 credits of electives. All students may choose electives from the full range of courses offered or focus 12 credits of electives in one of the concentrations below. At least 9 credits of electives must be in biodefense; the remaining credits (3-6) may be from outside biodefense with prior written approval of the director.

**3 credits of project or 6 credits of thesis**

Students must demonstrate the ability to conduct original, independent research by completing a research project or a thesis. The objectives of both the research project and thesis are to serve as a capstone for the student’s graduate education and to demonstrate the student’s research, analytical, and writing skills. Both options require the student to produce a substantial and original contribution to the fields of biodefense or biosecurity on the model of a paper suitable for presentation at a scholarly conference or an article in a peer-reviewed scholarly journal.

Students should be aware of the university policies governing theses. They must follow the thesis enrollment policy and, once enrolled in BIOD 799, maintain continuous enrollment. These policies are specified in the Academic Policies chapter of the catalog.

- BIOD 798 - Master's Research Project in Biodefense Credits: 3
- BIOD 799 - Master's Thesis in Biodefense Credits: 1-6
Total: 36 credits

Concentrations

Students have the option of applying 12 credits of electives to complete one of the concentrations below.

▲ Concentration in Homeland Security (HMLS)

Four courses (12 credits) chosen from:

- BIOD 710 - Approaches to Bioweapon Medical Treatment and Response Credits: 3
- BIOD 722 - Examining Terrorist Groups Credits: 3
- BIOD 723 - Legal Dimensions of Homeland Security Credits: 3
- BIOD 725 - Terrorism and Weapons of Mass Destruction Credits: 3
- BIOD 726 - Agroterrorism and Food Security Credits: 3
- BIOD 751 - Biosurveillance Credits: 3
- BIOD 752 - The Role of the Military in Homeland Security Credits: 3
- BIOD 760 - National Security Technology and Policy Credits: 3
- BIOD 766 - Development of Vaccines and Therapeutics Credits: 3
- GOVT 510 - American Government and Politics Credits: 3
- GOVT 706 - Federalism and Intergovernmental Relations Credits: 3
- GOVT 755 - Seminar in Politics and Bureaucracy Credits: 3
- PHIL 642 - Biomedical Ethics Credits: 3
- PUAD 631 - Disaster Response Operations and Recovery Credits: 3
- PUAD 635 - Emergency Preparedness: Interagency Communication and Coordination Credits: 3
- PUAD 727 - Seminar in Risk Assessment and Decision Making Credits: 3
- PUAD 731 - Homeland/Transportation Security Administration Credits: 3
- PUAD 750 - Federalism and Intergovernmental Relations Credits: 3
- PUBP 757 - Public Policy in Global Health and Medical Practice Credits: 3
- PUBP 758 - Global Threats and Medical Policies Credits: 3

▲ Concentration in International Security (INLS)

Four courses (12 credits) chosen from:

- BIOD 620 - Health and Security Credits: 3
- BIOD 621 - Ethics and International Security Credits: 3
- BIOD 622 - Negotiating in the International Arena Credits: 3
- BIOD 705 - Intelligence: Theory and Practice Credits: 3
- BIOD 706 - Nuclear, Biological, and Chemical Weapons Policy and Security Credits: 3
- BIOD 709 - Nonproliferation and Arms Control Credits: 3
- BIOD 722 - Examining Terrorist Groups Credits: 3
- BIOD 725 - Terrorism and Weapons of Mass Destruction Credits: 3
Political Science, MA

Banner Code: LA-MA-POS

Web: pia.gmu.edu

The MA in political science program prepares students for advanced work in political science, teaching, and research about government; a career in government and politics; and work in domestic and international nongovernmental organizations. Students may specialize in American government and politics, international relations, or comparative politics. In addition, interdisciplinary opportunities allow students to take up to 9 credits in related fields such as history or public policy.

The program is made up of four core courses in political science, two required seminars in a field of specialization, advanced seminars in the Department of Public and International Affairs, and elective courses in other departments.

The master's degree is the first step in an engaging and stimulating career. Students develop a deeper understanding of political ideas and institutions, more sophisticated research skills, a better grasp of the intricacies of governments abroad, and a deeper knowledge of the complexities of international politics. This degree can lead to a career teaching about government; working with legislative bodies, government agencies, and international organizations; or doing research and writing about politics and government.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in political science, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

Students should develop an education plan with their advisors that lists the courses they plan to take. The plan is approved by the student's advisor. Students may include courses from other departments to complement their field of specialization; they should reflect the ideas, institutions, or processes of contemporary governance.

Students who wish to begin a career in government and politics or to alter their current career path in government and politics are encouraged to take a 3-credit internship in their area of interest. Internships can be arranged through the Department of Public and International Affairs.

Four core courses (12 credits)
• GOVT 510 - American Government and Politics Credits: 3
• GOVT 520 - Political Theory Credits: 3
• GOVT 530 - Comparative Politics Credits: 3
• GOVT 540 - International Relations Credits: 3

Two methods courses (6 credits)

• GOVT 500 - The Scientific Method and Research Design Credits: 3
• GOVT 511 - Problem Solving and Data Analysis I Credits: 3

Three to five courses (9 to 15 credits) in one field of specialization:

American government and politics

Two required field seminars (6 credits) chosen from:

• GOVT 603 - Seminar in the Courts and Constitutional Law Credits: 3
• GOVT 604 - Seminar on Congress and Legislative Behavior Credits: 3
• GOVT 605 - Seminar on the Presidency Credits: 3
• GOVT 706 - Federalism and Intergovernmental Relations Credits: 3

One to three elective courses (3 to 9 credits)

Comparative politics

Two required field seminars (6 credits)

• GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3
• GOVT 731 - Advanced Seminar in Comparative Politics Credits: 3

One to three elective courses (3 to 9 credits)

International relations
Two required field seminars (6 credits) chosen from:

- GOVT 641 - Seminar in Global Systems Credits: 3
- GOVT 741 - Advanced Seminar in International Politics Credits: 3
- GOVT 743 - International Political Economy Credits: 3
- GOVT 745 - International Security Credits: 3

One to three elective courses (3 to 9 credits)

Up to two elective courses (0-6 credits)

The number of electives students have will depend on how many credits they took in the field of specialization and whether they choose a 3-credit project or a 6-credit thesis. Students choose the remaining credits required for the degree, if any, from other courses in the department, including an internship, additional courses in the field of specialization, or from course work offered by other departments.

3 credits of project or 6 credits of thesis

A project or thesis is required for the MA in political science. Students who choose to do a project take 3 credits of GOVT 798 linked to an advanced specialty course and produce a final research project. Students who choose to do a thesis should be aware of the policies governing theses. They must follow the enrollment policy of the university and, once enrolled in GOVT 799, must maintain continuous enrollment as specified in the Academic Policies chapter of the catalog. A thesis director and a committee of two additional faculty members appointed by the department read and approve the thesis. Students should make arrangements for doing a project or thesis with their advisor.

- GOVT 798 - Political Science Research Project Credits: 3
- GOVT 799 - Political Science Thesis Credits: 1-6

Total: 36 credits

Master's International

The Master’s International (MI), a joint program between Mason and the Peace Corps, enables participants to prepare for Peace Corps volunteer service while earning the MA. Students apply separately, but at the same time, to the Peace Corps and to Mason. Students must complete a minimum of 18 credits prior to their Peace Corps service; this will give the student a foundation to enhance their value as a Peace Corps volunteer. Six credits are earned as internship credits for the Peace Corps service. The internship requires a project, agreed upon by the student and his/her advisor, and includes a presentation delivered to faculty and students after the student returns to the US. Upon completion of the two years of service, the student will receive a tuition grant for the six internship credits. Students return to Mason after their two years of service to complete the remaining coursework required for the 36-credit MA.

Public Administration, MPA
The master of public administration (MPA) is designed to build the knowledge base and skills of people who will play a leadership role in organizations that develop or implement public policy. This program is among the first to address implications of the growing reliance of government on a wide range of third parties, including other governments, private contractors, and nonprofits, for public goals and accountability.

MPA students at Mason have the research and cultural resources of the Washington, D.C. area at their disposal. Government agencies representing all levels in the U.S. federal system are located close to the campus, as are the National Archives, the Library of Congress, and the Smithsonian Institution. Another benefit is the wide range of internship opportunities available in governmental and nonprofit organizations. The MPA Program regularly has internship invitations from national, state, and local government organizations, as well as from nonprofit organizations whose principal work is at the local, state, national, or international levels. Many of these internships are paid positions.

MPA courses are held at the Fairfax and the Arlington campuses during the week and on the weekend in an accelerated format.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MPA, see Application Requirements and Deadlines on the departmental web site.

Transfer of Credit

Students may transfer credit into the MPA program from graduate courses taken at other institutions or taken at Mason in nondegree status. Transfer credit is subject to university and college policies and must be approved by the MPA director and the dean. Students who enroll initially through nondegree studies should submit their application to the MPA in the first semester of study. Only 9 credits taken in nondegree status may be transferred to the degree program.

Degree Requirements

The required courses emphasize the development of knowledge about public policy and management, as well as analytical problem-solving and communication skills, and third-party governance. Through these courses, students develop a shared knowledge base and skill set. The elective courses can be used by students to focus their knowledge and skill development within one concentration. Alternatively, the electives can be used to extend the breadth of study with courses drawn from a variety of concentrations or from other departments and schools across the university.

The MPA curriculum is arranged in a sequential manner. PUAD 500 level courses are foundation courses, 600 level courses are intermediate courses, and the 700 level courses are advanced courses. Students must take PUAD 500 level, or foundation courses, during the first two semesters, followed by 600 level classes. The PUAD 700 level courses should be taken during the last semester or two of enrollment in the MPA program.

For example, a full-time student should enroll in PUAD 502 and two other 500 level courses, such as PUAD 511 and PUAD 520, during the first semester. In the second semester the student should enroll in PUAD 540 and two intermediate courses such as PUAD 662 and a 600 level elective course.
Part-time students taking two courses a semester should take PUAD 502 and either PUAD 511 or 520 during the first semester, followed by either 511 or 520 and PUAD 540 in the second semester.

Requests for taking a course out of sequence must be made in writing to the student's advisor and must be approved by the advisor before enrollment.

**Six core courses (18 credits)**

- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 511 - Problem Solving and Data Analysis I Credits: 3
- PUAD 520 - Organization Theory and Management Behavior Credits: 3
- PUAD 540 - Public Policy Process Credits: 3
- PUAD 700 - Ethics and Public Administration Credits: 3
- PUAD 703 - Third-Party Governance Credits: 3

**One additional methods course (3 credits) chosen from:**

- PUAD 612 - Problem Solving and Data Analysis II Credits: 3
- PUAD 613 - Economic Analysis in Public Administration Credits: 3
- PUAD 645 - Policy Analysis Credits: 3
- PUAD 646 - Program Evaluation Credits: 3

**One course (3 credits) in accounting, budgeting, and financial management chosen from:**

- PUAD 660 - Public and Nonprofit Accounting and Finance Credits: 3
- PUAD 662 - National Budgeting Credits: 3
- PUAD 663 - State and Local Budgeting Credits: 3
- PUAD 664 - Nonprofit Financial Management Credits: 3

**Four elective courses (12 credits)**

Students may take their elective courses within one of the concentrations listed below. As an alternative, with the approval of their advisor, students may select their elective courses from several concentrations or fields.

**Concentrations**

Students may declare only one concentration. PUAD 794 Internship and PUAD 796 Directed Reading and Research may be applied to a concentration where content is appropriate and with prior written approval of the student's advisor. Other courses may also be applied to a concentration with prior written approval of the advisor.

▲ **Concentration in Administration of Justice (ADJ)**
Four courses (12 credits) chosen from:

- PUAD 730 - Professional Development Workshop Credits: 1-3
- PUAD 781 - Information Management: Technology and Policy Credits: 3
- CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3
- CRIM 509 - Justice Organizations and Processes Credits: 3
- CRIM 510 - Policing in a Democratic Society Credits: 3
- CRIM 691 - Justice Program Planning and Implementation Credits: 3
- CRIM 740 - Justice Organization and Administration Credits: 3
- CRIM 741 - Conduct of Justice Organizations at the Street Level Credits: 3
- CRIM 742 - Leadership in Justice and Security Organizations Credits: 3
- CRIM 743 - Changing Justice and Security Organizations Credits: 3
- CRIM 749 - Issues in Justice Administration Credits: 1-3
- CRIM 781 - Justice Program Evaluation Credits: 3
- SOCI 607 - Criminology Credits: 3
- SOCI 608 - Juvenile Delinquency Credits: 3
- SOCI 609 - Sociology of Punishment and Corrections Credits: 3

Total: 12 credits

▲ Concentration in Emergency Management and Homeland Security (EMHS)

Four courses (12 credits) chosen from:

- PUAD 630 - Emergency Planning and Preparedness Credits: 3
- PUAD 631 - Disaster Response Operations and Recovery Credits: 3
- PUAD 632 - Terrorism: Theory and Practice Credits: 3
- PUAD 633 - Hazard Mitigation Policy Credits: 3
- PUAD 634 - Management of International Security Credits: 3
- PUAD 635 - Emergency Preparedness: Interagency Communication and Coordination Credits: 3
- PUAD 637 - Managing Homeland Security Credits: 3
- PUAD 727 - Seminar in Risk Assessment and Decision Making Credits: 3
- PUAD 731 - Homeland/Transportation Security Administration Credits: 3
- PUAD 738 - Issues in International Security Credits: 3
- BIOD 723 - Legal Dimensions of Homeland Security Credits: 3
- BIOD 752 - The Role of the Military in Homeland Security Credits: 3
- COMM 637 - Risk Communication Credits: 3
- PUBP 742 - Transportation Safety and Security Credits: 3
- PUBP 754 - Geographic Information Systems and Spatial Analysis for Public Policy Credits: 3
- PUBP 758 - Global Threats and Medical Policies Credits: 3

Total: 12 credits
▲ Concentration in Environmental Science and Public Policy (EVPP)

CONF 695 - Selected Topics and COMM 590 - Seminar in Communication when topic is the environment, may be used to fulfill this requirement with the prior written approval of the student's advisor.

One required course (3 credits):

- PUAD 642 - Environmental Policy Credits: 3

Three elective courses (9 credits) chosen from:

- PUAD 645 - Policy Analysis Credits: 3
- PUAD 646 - Program Evaluation Credits: 3 (if not already taken to meet core requirements)
- PUAD 649 - Advocacy and Lobbying Credits: 3
- EVPP 524 - Introduction to Environmental and Resource Economics Credits: 3
- EVPP 607 - Fundamentals of Ecology Credits: 3
- EVPP 638 - Corporate Environmental Management and Policy Credits: 3
- EVPP 641 - Environmental Science and Public Policy Credits: 3
- EVPP 670 - Environmental Law Credits: 3
- CONF 695 - Selected Topics Credits: 3
- COMM 590 - Seminar in Communication Credits: 3

Total: 12 credits

▲ Concentration in Human Resources Management (HRM)

One required course (3 credits):

- PUAD 670 - Human Resources Management in the Public Sector Credits: 3

Three elective courses (9 credits) chosen from:

- PUAD 623 - Managing Government Contracting Credits: 3
- PUAD 652 - Nonprofit Leadership and Change Credits: 3
- PUAD 671 - Public Employee Labor Relations Credits: 3
- PUAD 672 - Human Resources Reforms for Public Administration Credits: 3
- PUAD 729 - Issues in Public Management Credits: 3
- PUAD 730 - Professional Development Workshop Credits: 1-3
- PSYC 631 - Industrial and Personnel Testing and Evaluation Credits: 3
- PSYC 636 - Survey of Industrial Psychology Credits: 3
- PSYC 638 - Training: Psychological Contributions to Theory, Design, and Evaluation Credits: 3
- PSYC 639 - Survey of Organizational Processes Credits: 3
- PSYC 667 - Behavior in Small Groups and Teams Credits: 3
- PSYC 739 - Seminar in Industrial/Organizational Psychology Credits: 3
- ODKM 705 - Group Dynamics and Team Learning Credits: 3
- ODKM 715 - Creating Learning Organizations Credits: 3
- ODKM 731 - Consulting Skills for Organizational Change Credits: 3
- ODKM 735 - Organizational Development Practices Credits: 3

Total: 12 credits

▲ Concentration in International Management (IM)

One required course (3 credits):

- PUAD 504 - Managing in the International Arena: Theory and Practice Credits: 3

Three elective courses (9 credits) chosen from:

- CONF and ITRN courses with written prior approval of the director
- PUAD 634 - Management of International Security Credits: 3
- PUAD 636 - The NGO: Policy and Management Credits: 3
- PUAD 730 - Professional Development Workshop Credits: 1-3
- PUAD 738 - Issues in International Security Credits: 3
- PUAD 739 - Issues in International Management Credits: 3
- GOVT 540 - International Relations Credits: 3
- GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3

Total: 12 credits

▲ Concentration in Nonprofit Management (NPMG)

Students in the nonprofit concentration may take PUAD 505 as one of their first four courses and may take 505 simultaneously with PUAD 502. Likewise, students in the international concentration may take PUAD 504 as one of their first four courses.

Two required courses (6 credits):

- PUAD 505 - Introduction to Management of Nonprofits Credits: 3
- PUAD 659 - Nonprofit Law, Governance, and Ethics Credits: 3

Two elective courses (6 credits) chosen from:
- PUAD 636 - The NGO: Policy and Management Credits: 3
- PUAD 649 - Advocacy and Lobbying Credits: 3
- PUAD 652 - Nonprofit Leadership and Change Credits: 3
- PUAD 654 - The Community, Marketing, and Public Relations Credits: 3
- PUAD 655 - Philanthropy and Fund Raising Credits: 3
- PUAD 657 - Association Management Credits: 3
- PUAD 658 - Social Entrepreneurship and Nonprofit Enterprise Credits: 3
- PUAD 660 - Public and Nonprofit Accounting and Finance Credits: 3
- PUAD 664 - Nonprofit Financial Management Credits: 3
- PUAD 680 - Managing Information Resources Credits: 3
- PUAD 720 - Performance Measurement Credits: 3
- PUAD 730 - Professional Development Workshop Credits: 1-3

Total: 12 credits

▲ Concentration in Policy Studies (PS)

Four courses (12 credits) chosen from:

- PUAD 615 - Administrative Law Credits: 3
- PUAD 622 - Program Planning and Implementation Credits: 3
- PUAD 645 - Policy Analysis Credits: 3
- PUAD 646 - Program Evaluation Credits: 3
- PUAD 658 - Social Entrepreneurship and Nonprofit Enterprise Credits: 3
- PUAD 661 - Public Budgeting Systems Credits: 3
- PUAD 662 - National Budgeting Credits: 3
- PUAD 663 - State and Local Budgeting Credits: 3
- PUAD 680 - Managing Information Resources Credits: 3
- PUAD 727 - Seminar in Risk Assessment and Decision Making Credits: 3
- PUAD 730 - Professional Development Workshop Credits: 1-3
- PUAD 749 - Issues in Public Policy Credits: 3
- PUAD 750 - Federalism and Intergovernmental Relations Credits: 3
- PUAD 781 - Information Management: Technology and Policy Credits: 3
- GOVT 520 - Political Theory Credits: 3
- GOVT 605 - Seminar on the Presidency Credits: 3

Total: 12 credits

▲ Concentration in Public Management (PMG)

Four courses (12 credits) chosen from:

- PUAD 615 - Administrative Law Credits: 3
- PUAD 622 - Program Planning and Implementation Credits: 3
- PUAD 623 - Managing Government Contracting Credits: 3
- PUAD 658 - Social Entrepreneurship and Nonprofit Enterprise Credits: 3
- PUAD 660 - Public and Nonprofit Accounting and Finance Credits: 3
- PUAD 661 - Public Budgeting Systems Credits: 3
- PUAD 662 - National Budgeting Credits: 3
- PUAD 663 - State and Local Budgeting Credits: 3
- PUAD 664 - Nonprofit Financial Management Credits: 3
- PUAD 670 - Human Resources Management in the Public Sector Credits: 3
- PUAD 672 - Human Resources Reform for Public Administration Credits: 3
- PUAD 680 - Managing Information Resources Credits: 3
- PUAD 720 - Performance Measurement Credits: 3
- PUAD 729 - Issues in Public Management Credits: 3
- PUAD 730 - Professional Development Workshop Credits: 1-3
- PUAD 731 - Homeland/Transportation Security Administration Credits: 3
- PUAD 750 - Federalism and Intergovernmental Relations Credits: 3
- PUAD 781 - Information Management: Technology and Policy Credits: 3

Total: 12 credits

▲ Concentration in Public and Nonprofit Finance (PNF)

Four courses (12 credits) chosen from:

- PUAD 658 - Social Entrepreneurship and Nonprofit Enterprise Credits: 3
- PUAD 660 - Public and Nonprofit Accounting and Finance Credits: 3
- PUAD 661 - Public Budgeting Systems Credits: 3
- PUAD 662 - National Budgeting Credits: 3
- PUAD 663 - State and Local Budgeting Credits: 3
- PUAD 664 - Nonprofit Financial Management Credits: 3
- PUAD 729 - Issues in Public Management Credits: 3
- PUAD 730 - Professional Development Workshop Credits: 1-3
- PUAD 769 - Issues in Public Financial Management Credits: 3

Total: 12 credits

▲ Concentration in State and Local Government (SLG)

Four courses (12 credits) chosen from:

- PUAD 505 - Introduction to Management of Nonprofits Credits: 3
- PUAD 615 - Administrative Law Credits: 3
- PUAD 623 - Managing Government Contracting Credits: 3
• PUAD 630 - Emergency Planning and Preparedness Credits: 3
• PUAD 651 - Virginia Politics, Policy, and Administration Credits: 3
• PUAD 660 - Public and Nonprofit Accounting and Finance Credits: 3
• PUAD 661 - Public Budgeting Systems Credits: 3
• PUAD 662 - National Budgeting Credits: 3
• PUAD 663 - State and Local Budgeting Credits: 3
• PUAD 680 - Managing Information Resources Credits: 3
• PUAD 729 - Issues in Public Management Credits: 3
• PUAD 730 - Professional Development Workshop Credits: 1-3
• PUAD 750 - Federalism and Intergovernmental Relations Credits: 3
• PUAD 759 - Issues in Local Government Administration Credits: 3
• PUAD 781 - Information Management: Technology and Policy Credits: 3

Total: 12 credits

▲ Concentration in Third-Party Governance (TPG)

Four courses (12 credits) chosen from:

• PUAD 613 - Economic Analysis in Public Administration Credits: 3
• PUAD 622 - Program Planning and Implementation Credits: 3
• PUAD 623 - Managing Government Contracting Credits: 3
• PUAD 635 - Emergency Preparedness: Interagency Communication and Coordination Credits: 3
• PUAD 636 - The NGO: Policy and Management Credits: 3
• PUAD 658 - Social Entrepreneurship and Nonprofit Enterprise Credits: 3
• PUAD 659 - Nonprofit Law, Governance, and Ethics Credits: 3
• PUAD 750 - Federalism and Intergovernmental Relations Credits: 3

Total: 12 credits

Total: 36 credits

Master’s International

The Master’s International (MI), a joint program between Mason and the Peace Corps, enables participants to prepare for Peace Corps volunteer service while earning the MPA. Students apply separately, but at the same time, to the Peace Corps and to Mason. Students must complete a minimum of 18 credits prior to their Peace Corps service; this will give the student a foundation to enhance their value as a Peace Corps volunteer. Six credits are earned as internship credits for the Peace Corps service. The internship requires a project, agreed upon by the student and his/her advisor, and includes a presentation delivered to faculty and students after the student returns to the U.S. Upon completion of the two years of service, the student will receive a
tuition grant for the six internship credits. Students return to Mason after their two years of service to complete the remaining coursework required for the 36-credit MPA.

Master's Level Certificate

Administration of Justice Graduate Certificate

Banner Code: LA-CERG-ADJ

Web: pia.gmu.edu

This program of study is offered by the Department of Public and International Affairs.

The graduate certificate in administration of justice may only be pursued on a part-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in administration of justice, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Three required courses (9 credits)

- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- CRIM 509 - Justice Organizations and Processes Credits: 3
- CRIM 691 - Justice Program Planning and Implementation Credits: 3

Two elective courses (6 credits)

Students choose electives from courses in criminology (CRIM). A list of relevant electives is available under the concentration in administration of justice in the MPA (master of public administration) entry of the catalog.

Total: 15 credits

Association Management Graduate Certificate

Banner Code: LA-CERG-AM
This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in association management may only be pursued on a part-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in association management, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Three required courses (9 credits)

- PUAD 657 - Association Management Credits: 3
- PUAD 659 - Nonprofit Law, Governance, and Ethics Credits: 3
- PUAD 664 - Nonprofit Financial Management Credits: 3

Two elective courses (6 credits)

Students choose electives in the nonprofit area. A list of relevant electives is available under the concentration in nonprofit management in the MPA (master of public administration) entry of the catalog.

Total: 15 credits

Critical Analysis and Strategic Responses to Terrorism Graduate Certificate

Banner Code: LA-CERG-CASR

The certificate in critical analysis and strategic responses to terrorism (CASR) is an interdisciplinary introduction to the phenomenon of modern terrorism and its implications for US domestic and foreign policy. It focuses on multidisciplinary analysis and holistic cross-sectorial approaches to long-term prevention of and response to terrorism.

This program of study is offered by the Department of Public and International Affairs.
For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in critical analysis and strategic responses to terrorism may only be pursued on a part-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in critical analysis and strategic responses to terrorism, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Two required courses (6 credits)

- GOVT 541 - Introduction to Critical Analysis and Strategic Response to Terrorism Credits: 3
- GOVT 640 - Strategic Responses to Terrorism: Coordinated Decision Making Credits: 3

Three elective courses (9 credits) related to terrorism analysis or response

Courses should be chosen in consultation with an advisor and approved in advance by the program director.

Total: 15 credits

Emergency Management and Homeland Security Graduate Certificate

Banner Code: LA-CERG-EMHS

Web: pia.gmu.edu

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in emergency management and homeland security may only be pursued on a part-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in emergency management and homeland security, see Application Requirements and Deadlines on departmental web site.
Certificate Requirements

Three required courses (9 credits)

- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 630 - Emergency Planning and Preparedness Credits: 3
- PUAD 637 - Managing Homeland Security Credits: 3

Two elective courses (6 credits)

Students choose electives in the emergency management and homeland security area. A list of relevant electives is available under the concentration in emergency management and homeland security in the MPA (master of public administration) entry of the catalog.

Total: 15 credits

Nonprofit Management Graduate Certificate

Banner Code: LA-CERG-NPMG

Web: pia.gmu.edu

This certificate is offered face-to-face or online.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in nonprofit management may only be pursued on a part-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in nonprofit management, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Three required courses (9 credits)
- PUAD 505 - Introduction to Management of Nonprofits Credits: 3
- PUAD 659 - Nonprofit Law, Governance, and Ethics Credits: 3
- PUAD 664 - Nonprofit Financial Management Credits: 3

Two elective courses (6 credits)

Students choose electives in the nonprofit area. A list of relevant electives is available under the concentration in nonprofit management in the MPA (master of public administration) entry of the catalog.

Total: 15 credits

Public Management Graduate Certificate

Banner Code: LA-CERG-PMG

Web: pia.gmu.edu

This program of study is offered by the Department of Public and International Affairs.

For policies governing all certificates, see the Academic Policies chapter of the catalog.

The graduate certificate in public management may only be pursued on a part-time basis.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in public management, see Application Requirements and Deadlines on the departmental web site.

Certificate Requirements

Three required courses (9 credits)

- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3

Two elective courses (6 credits)
Students choose electives in the public management area. A list of relevant electives is available under the concentration in public management in the MPA (master of public administration) entry of the catalog.

Total: 15 credits

**Doctoral Degree**

**Biodefense, PhD**

*Banner Code: LA-PHD-BIOD*

*Web: pia.gmu.edu*

The doctoral program in biodefense is designed to prepare students to serve as scholars and professionals in the fields of biodefense and biosecurity. The program integrates knowledge of natural and man-made biological threats with the skills to develop and analyze policies and strategies for enhancing biosecurity. Other areas of biodefense, including nonproliferation, intelligence and threat assessment, and medical and public health preparedness are integral parts of the program.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the PhD in biodefense, see Application Requirements and Deadlines on the departmental web site.

**Reduction of Credit**

Students who enter the doctoral program with a master’s degree or other graduate credit may have their credit reduced by up to 30 credits at the discretion of the department with the approval of the dean.

**Advancement to Candidacy**

To advance to candidacy, students must complete all coursework required on their approved program of study. They must also successfully pass a qualifying exam.

**Degree Requirements**

To receive a PhD in biodefense, students must complete a minimum of 72 credits. Students are strongly encouraged to take the core courses as early as possible because they provide the foundation for the rest of the program. The courses that students plan on taking should be approved in an program of study designed by the student and their advisor during the student’s first semester. Students may take up to 12 credits of courses outside of the Biodefense Program with prior written approval of their
advisor. Consult with the graduate program director or coordinator for a list of BIOD electives and approved non-BIOD electives that can be used to fulfill some of the requirements below.

Seven core courses (21 credits)

- BIOD 604 - Introduction to Biodefense I: Bacterial and Toxin Agents Credits: 3
- BIOD 605 - Introduction to Biodefense II: Viral Agents Credits: 3
- BIOD 609 - Biodefense Strategy and Policy Credits: 3
- GOVT 500 - The Scientific Method and Research Design Credits: 3
- GOVT 540 - International Relations Credits: 3
- PUAD 630 - Emergency Planning and Preparedness Credits: 3
- One additional advanced research course (3 credits) approved by the program director. May be focused on qualitative or quantitative research.

Four courses (12 credits) in one concentration

▲ Concentration in International Security (INLS)

Four courses (12 credits) chosen from:

- BIOD 620 - Health and Security Credits: 3
- BIOD 621 - Ethics and International Security Credits: 3
- BIOD 622 - Negotiating in the International Arena Credits: 3
- BIOD 705 - Intelligence: Theory and Practice Credits: 3
- BIOD 706 - Nuclear, Biological, and Chemical Weapons Policy and Security Credits: 3
- BIOD 709 - Nonproliferation and Arms Control Credits: 3
- BIOD 722 - Examining Terrorist Groups Credits: 3
- BIOD 725 - Terrorism and Weapons of Mass Destruction Credits: 3
- BIOD 760 - National Security Technology and Policy Credits: 3
- GOVT 641 - Seminar in Global Systems Credits: 3
- GOVT 741 - Advanced Seminar in International Politics Credits: 3
- GOVT 843 - Diplomacy Credits: 3
- PUAD 504 - Managing in the International Arena: Theory and Practice Credits: 3
- PUAD 701 - Cross-Cultural and Ethical Dimensions of International Management Credits: 3
- PUAD 727 - Seminar in Risk Assessment and Decision Making Credits: 3

Total: 12 credits

▲ Concentration in Homeland Security (HMLS)
Four courses (12 credits) chosen from:

- BIOD 710 - Approaches to Bioweapon Medical Treatment and Response Credits: 3
- BIOD 722 - Examining Terrorist Groups Credits: 3
- BIOD 723 - Legal Dimensions of Homeland Security Credits: 3
- BIOD 725 - Terrorism and Weapons of Mass Destruction Credits: 3
- BIOD 726 - Agroterrorism and Food Security Credits: 3
- BIOD 751 - Biosurveillance Credits: 3
- BIOD 752 - The Role of the Military in Homeland Security Credits: 3
- BIOD 760 - National Security Technology and Policy Credits: 3
- BIOD 762 - Into the Hot Zone: Working in a High Threat Environment Credits: 2
- BIOD 766 - Development of Vaccines and Therapeutics Credits: 3
- GOVT 510 - American Government and Politics Credits: 3
- GOVT 706 - Federalism and Intergovernmental Relations Credits: 3
- GOVT 755 - Seminar in Politics and Bureaucracy Credits: 3
- PHIL 642 - Biomedical Ethics Credits: 3
- PUAD 631 - Disaster Response Operations and Recovery Credits: 3
- PUAD 635 - Emergency Preparedness: Interagency Communication and Coordination Credits: 3
- PUAD 727 - Seminar in Risk Assessment and Decision Making Credits: 3
- PUAD 731 - Homeland/Transportation Security Administration Credits: 3
- PUAD 750 - Federalism and Intergovernmental Relations Credits: 3
- PUAD 758 - Environmental Politics Credits: 3

Total: 12 credits

Two courses (6 credits)

Of the courses listed for the two concentrations above, students should select courses from the concentration that is not their chosen concentration.

Electives (9-21)

Students complete the remaining 72 credits through additional elective courses chosen in consultation with an advisor.

Dissertation (12-24 credits)

Once enrolled in 998, students in this degree program must maintain continuous registration in 998 or 999 each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students may apply to this degree a minimum of 3 and a maximum of 6 credits of 998 and a minimum of 9 and a maximum of 21 credits of 999. They may apply a maximum of 24 dissertation credits (998 and 999 combined) to the degree. Because of the continuous registration policy, students may be required to register for additional credits of these courses.
Before registering in BIOD 999, students must offer a successful public defense of the dissertation proposal. Students must present the results of the dissertation research to their dissertation committee in a seminar and defend their dissertation to the university community. Successful completion of a dissertation is contingent on approval of the dissertation committee and the dean.

- BIOD 998 - Doctoral Dissertation Proposal Credits: 1-12
- BIOD 999 - Doctoral Dissertation Credits: 1-12

Total: 72 credits

Political Science, PhD

Banner Code: LA-PHD-POS

Web: pia.gmu.edu

The doctoral program in political science is designed to prepare students for teaching and conducting research about government, careers in government and politics, and work in domestic and international nongovernmental organizations. The program allows students to combine their academic education with experience in the kinds of complex domestic and international political organizations they are studying. This model for political science education, patterned after the American Political Science Association’s Congressional Fellows Program, is designed to foster scholarship and a firsthand understanding of domestic and international institutions such as think tanks, international bodies, nongovernmental organizations, journals of political opinion, and congressional and executive branch offices.

This program of study is offered by the Department of Public and International Affairs.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the PhD in political science, see Application Requirements and Deadlines on the departmental web site.

Reduction of Credit

For students entering the program with a master’s or MPA degree, the number of credits required for the doctorate may be reduced by a maximum of 30 credits subject to approval of the graduate coordinator and the dean.

Progress Review

For students who have been admitted with a bachelor’s degree, the Faculty Review Committee will review each student’s progress after 30 credits of course work to determine whether the student will be allowed to continue their work toward the PhD. For students entering the program with a master’s degree, this review will occur after 12 credits in this program. Students that are not allowed to continue to work toward the PhD, will be allowed to complete the MA degree.
Degree Requirements

Students pursuing this degree must complete a minimum of 72 graduate credits. The course work for the degree is divided among core courses, advanced courses in two major fields and one minor field, research methods courses, experiential learning, and dissertation. A total of 12 credits of supporting courses may be taken in other departments to fulfill a minority of the credits for any of the requirements below, including the methodology requirement, with prior written approval of the director. All the courses should be planned with an advisor and appear on a program of study, which requires the approval of the director.

Three core courses (9 credits) chosen from:

- GOVT 510 - American Government and Politics Credits: 3
- GOVT 520 - Political Theory Credits: 3
- GOVT 530 - Comparative Politics Credits: 3
- GOVT 540 - International Relations Credits: 3
- GOVT 550 - Seminar in Theories of Public Administration Credits: 3

Seven advanced courses (21 credits) in two major fields

Students choose two major fields from the four fields below.

American government and politics

Two required field seminars (6 credits) chosen from:

- GOVT 603 - Seminar in the Courts and Constitutional Law Credits: 3
- GOVT 604 - Seminar on Congress and Legislative Behavior Credits: 3
- GOVT 605 - Seminar on the Presidency Credits: 3
- GOVT 706 - Federalism and Intergovernmental Relations Credits: 3

One to three elective courses (3 to 9 credits)

Comparative politics

Two required field seminars (6 credits)

- GOVT 631 - Seminar in Comparative Politics and Institutions Credits: 3
- GOVT 731 - Advanced Seminar in Comparative Politics Credits: 3

One to three elective courses (3 to 9 credits)
International relations

Two required field seminars (6 credits) chosen from:

- GOVT 641 - Seminar in Global Systems Credits: 3
- GOVT 741 - Advanced Seminar in International Politics Credits: 3
- GOVT 743 - International Political Economy Credits: 3
- GOVT 745 - International Security Credits: 3

One to three elective courses (3 to 9 credits)

Public administration

Two required field seminars (6 credits)

- GOVT 753 - Third-Party Governance Credits: 3
- GOVT 755 - Seminar in Politics and Bureaucracy Credits: 3

One to three elective courses (3 to 9 credits)

Three advanced courses (9 credits) in a minor field

Students choose one minor field in consultation with an advisor. The courses in the minor field should complement the two major fields and need the prior written approval of the advisor.

Three advanced courses (9 credits) in methodology

Two required methodology courses (6 credits)

- GOVT 500 - The Scientific Method and Research Design Credits: 3
- GOVT 511 - Problem Solving and Data Analysis I Credits: 3

One elective methodology course (3 credits)
Students choose an elective methodology course to meet their dissertation research needs. Course work in language or to help achieve proficiency in quantitative or qualitative research techniques may be used to meet this requirement with prior written approval of the program director.

**Electives (6-12 credits)**

A maximum of 6 credits of electives may come from experience in government and politics. Students do 20 hours per week in the field for one semester or 10 hours per week for two semesters. They produce an academic paper at the conclusion of the experience discussing the implications of their observations for research in the field and how scholarship in the field might be applied to an issue faced by the organization.

**Doctoral research skills**

Advanced work as needed to attain working research proficiency for the dissertation. Proficiency will be determined by satisfactory course work in methods or exam given at the time of the qualifying exam for language proficiency. Certification that this requirement has been met must be completed before advancement to candidacy.

**Dissertation (12-18 credits)**

Once enrolled in 998, students in this degree program must maintain continuous registration in 998 or 999 each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students may apply to this degree a minimum of 3 and a maximum of 6 credits of 998 and a minimum of 9 credits of 999. They apply a minimum of 12 and a maximum of 18 dissertation credits (998 and 999 combined) to the degree. Because of the continuous registration policy, students may be required to register for additional credits of these courses.

Students who do fewer than 18 credits of dissertation will complete their degree with additional elective courses.

- **GOVT 998** - Doctoral Dissertation Proposal Credits: 3-6
- **GOVT 999** - Doctoral Dissertation Research Credits: 1-12 (minimum of 9 credits)

**Total: 72 credits**

**Advancement to Candidacy**

To advance to candidacy, students must complete all course work required on their approved program of study. Students must also successfully complete and pass two qualifying exams in major fields. In addition, students must have an approved dissertation committee as well as an approved proposal. Evidence of the approved proposal must be on file in the Dean’s Office before a student can advance to candidacy.

■ **Religious Studies**

Phone: 703-993-1290
Web: religious.gmu.edu
Faculty

Professor: Ro (chair)

Professors emeriti: Burns

Associate professors: M. Dakake, Farina, Nguyen, Shiner

Assistant professors: Hammer, Rashkover, Seales

Adjuncts: Bond, D. Dakake, Dreyer, Hebbar, Hostetter, Padgett

Course Work

This department offers all course work designated RELI in the Courses chapter of this catalog.

Undergraduate Programs

The department offers a bachelor's degree in religious studies for students who are interested in learning more about the world's religious traditions. Majors explore the many dimensions of religion and study religion's spiritual, historical, cultural, and social aspects.

Areas of study offered by the department include Asian religious traditions, Near (Middle) East religious traditions (Judaism, Islam, and Christianity), and comparative aspects of religion. Though the required coursework, majors in religious studies develop skills in reading and interpreting sacred texts. They explore the cultural and social dimensions of religion along with a consideration of religious values and ethics, from comparative and cross-cultural perspectives with relation to global issues.

The courses in the undergraduate program are writing intensive. They enable students to study and analyze religious ideas and symbols and give them the skills they need to present well-argued papers.

Minors

Students majoring in religious studies are encouraged to do one of the many minors offered by the college. See the Minors and Interdisciplinary Minors section of this chapter.

The department also offers minors in religious studies and Judaic studies, both of which are available to students in all majors in the university.

Graduate Program

The department sponsors the concentration in religion, culture, and values in the master's degree in individualized studies (MAIS). This concentration is designed for students who interested in exploring the world's major religions at the graduate level. Students study the development and interaction of the global religious traditions that influence human identity, behavior, culture, and values. They investigate the effects that historical crises and the forces of change have on religion, placing contemporary religious pluralism and inter-religious dialog in a global context.

See the Interdisciplinary Studies section of this chapter for details.

Undergraduate Degree
Religious Studies, BA

Banner Code: LA-BA-RELI

Web: religious.gmu.edu

The goal of the major in religious studies is to bring students to an understanding of the major traditions of world religions. Areas of study offered by the department include Asian religious traditions, Near (Middle) East religious traditions (Judaism, Islam, and Christianity), and comparative aspects of religion. Students develop skills in reading and interpreting sacred texts. They explore the cultural and social dimensions of religion along with a consideration of religious values and ethics, from comparative and cross-cultural perspectives with relation to global issues.

The courses in religious studies are writing intensive. They help students to study and analyze religious ideas and symbols and give them the skills to present well-argued papers.

This program of study is offered by the Department of Religious Studies.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in religious studies must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students in this major complete at least 33 credits in religious studies, earning a minimum grade of 2.00 in each course. No course applied to the major in religious studies may be used to fulfill more than one requirement.

Two introductory courses (6 credits) in the main world religions

- RELI 211 - Religions of the West Credits: 3
- RELI 212 - Religions of Asia Credits: 3

One seminar (3 credits)

Students should take this course during their senior year.

- RELI 420 - Seminar Credits: 3

Two courses (6 credits) in comparative or methodological aspects of the study of religion chosen from:

- ANTH 313 - Myth, Magic, and Mind Credits: 3
- PHIL 313 - Philosophy of Religion Credits: 3
- RELI 337 - Mysticism: East and West Credits: 3
- RELI 341 - Global Perspectives on Spirituality and Healing Credits: 3
- RELI 490 - Comparative Study of Religions Credits: 3
- SOCI 385 - Sociology of Religion Credits: 3
- RELI 376 - Special Topics in Religious Thought Credits: 3 (when topic is relevant and with the prior written approval of the undergraduate director)

Four courses (12 credits) in religious studies

Students should choose from any religious studies courses at the 300 and 400 level other than those used to fulfill the requirements above. They can also choose courses in a scriptural language (such as Arabic, Biblical Hebrew, Chinese, Classical Greek, Latin, or Sanskrit). Up to 6 credits of a scriptural language may be used to fulfill this requirement and the 6 credits of electives.

Two elective courses (6 credits)

Students should choose elective courses in consultation with an advisor. They can choose from courses in religious studies, related disciplines (including anthropology, art history, and history), or a scriptural language (such as Arabic, Biblical Hebrew, Chinese, Classical Greek, Latin, or Sanskrit). Up to 6 credits of a scriptural language may be used to fulfill this requirement and the requirement of 12 credits in religious studies at 300 and 400 level.

Total: 33 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated "writing intensive" in their majors. Students majoring in religious studies fulfill this requirement by successfully completing RELI 420.

Undergraduate Minor

Judaic Studies Minor

Banner Code: JS

Web: religious.gmu.edu

The minor in Judaic studies is designed for students interested in the culture, history, and politics of Jewish communities across the world.

This program of study is offered by the Department of Religious Studies.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work
Students pursuing this minor must complete 15 credits of religious studies coursework with a minimum GPA of 2.00.

Three core courses (9 credits)

- RELI 352 - Judaism from Exile to Talmud Credits: 3
- RELI 370 - Judaism Credits: 3
- RELI 371 - Classic Jewish Texts Credits: 3

Two elective courses (6 credits) chosen from the list below:

Special topics courses and independent studies courses, when relevant, may be used to fulfill this requirement with prior written approval of the undergraduate director.

- HEBR 150 - Introduction to Biblical Hebrew Credits: 3
- HEBR 160 - Readings in Biblical Hebrew Credits: 3
- HIST 465 - The Middle East in the 20th Century Credits: 3
- RELI 211 - Religions of the West Credits: 3
- RELI 350 - Religion and History of Ancient Israel Credits: 3
- RELI 372 - American Judaism Credits: 3

Total: 15 credits

Religious Studies Minor

Banner Code: RELI

Web: religious.gmu.edu

The minor in religious studies introduces students to the world’s religious traditions. Within the minor, students may pursue religious traditions of Asia or the Near (Middle) East or comparative aspects of religion.

This program of study is offered by the Department of Religious Studies.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits with a minimum grade of 2.00 in each course.

One course (3 credits) chosen from:

- RELI 100 - The Human Religious Experience Credits: 3
• RELI 211 - Religions of the West Credits: 3
• RELI 212 - Religions of Asia Credits: 3

Five elective courses (15 credits) in religious studies

At least three courses (9 credits) must be at the 300 level or above.

Total: 18 credits

■ Russian and Eurasian Studies

Phone: 703-993-1233
Web: russianstudies.gmu.edu

Faculty

Barnes (History and Art History), Bockman (Sociology and Anthropology), Boettke (Economics), Christensen (Modern and Classical Languages), Johnsen-Neshati (Theater), Katz (Public and International Affairs), Kelly (History and Art History), Korostelina (Institute for Conflict Analysis and Resolution), Levine (Modern and Classical Languages, director), McGlinchey (Public and International Affairs), Pacynska (Institute for Conflict Analysis and Resolution), Vasilyeva-Roberts (Modern and Classical Languages), Wade (History and Art History)

Coursework

As an interdisciplinary program, Russian and Eurasian Studies draws on many courses from across the university. Students should consult with the director to determine whether a particular course may be used to fulfill a requirement or elective in the degree program.

Undergraduate Program

The bachelor's degree in Russian and Eurasian studies allows students to choose a concentration in one of three areas: Russian language and culture, Russia studies, or Eurasia studies.

Undergraduate Degree

Russian and Eurasian Studies, BA

Banner Code: LA-BA-REST
Web: russianstudies.gmu.edu

This program of study is offered by the Russian and Eurasian Studies Program.
Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in Russian and Eurasian studies must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 33 credits in one of the concentrations below with a minimum GPA of 2.00.

▲ Concentration in Eurasia Studies (EURS)

The Eurasia studies concentration is designed to provide students with interdisciplinary training in the study of Eurasia, with special focus on Central Asia and secondarily on Russia/the Soviet Union and Eastern Europe. Students will develop a high degree of competence in the history, politics, and culture of Eurasia and a basic competence in a relevant language.

Two courses (6 credits) of Russian or other Eurasian-related language

Courses used to meet this requirement may be in the same language that is used to meet the college language requirement, in which case the student needs to complete 6 credits beyond intermediate proficiency (beyond courses numbered 210 at Mason). With the approval of the director, courses used to meet this requirement may be in a Eurasian-related language that was not used to meet the college language requirement at a level approved by the director.

Two social science courses at the 300- and 400-level (6 credits)

Courses used to fulfill this requirement must focus primarily on Central Asia and Eurasia and may be in any social science discipline (ANTH, ECON, GGS, GOVT, SOCI).

Two history courses at the 300- and 400-level (6 credits)

Courses used to fulfill this requirement must focus primarily on Central Asia and Eurasia.

Two literature or film courses at the 300- and 400-level (6 credits)

Courses used to fulfill this requirement must be related to Eurasia.

Three courses at the 300- and 400-level (9 credits) chosen from:

Students choose from courses that focus predominantly on Eurasia. The courses used to meet this requirement may be in any field of study including special topics courses and other courses that deal primarily with the geographic areas covered in the Russian and Eurasian studies major. To use a special topics course or other course with variable content to meet this requirement, students should seek the advanced written approval of the director. (Special topics courses may be repeated for credit when the topic is different.) The following courses when the topic is relevant, among others, may be used to meet this requirement.

- ARTH 386 - The Silk Road Credits: 3
- HIST 328 - Rise of Russia Credits: 3
- HIST 329 - Modern Russia and the Soviet Union Credits: 3
- HIST 387 - Topics in Global History Credits: 3
- HIST 388 - Topics in European History Credits: 3
- HIST 460 - Modern Iran Credits: 3
- HIST 462 - Women in Islamic Society Credits: 3
- HIST 499 - Senior Seminar in History Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
- GOVT 340 - Central Asian Politics Credits: 3
- GOVT 345 - Political Islam Credits: 3
- GOVT 444 - Issues in International Studies Credits: 1-3
- GOVT 447 - Revolution and International Politics Credits: 3
- RUSS 470 - Topics in (Post) Soviet Film Credits: 3
- GGS 330 - Geography of the Soviet Succession States Credits: 3
- ECON 380 - Economies in Transition Credits: 3
- Any 300- or 400-level CONF course

Total: 33 credits

▲ Concentration in Russia Studies (RUSS)

The Russia studies concentration is designed to provide students with in-depth interdisciplinary training in Russia and the Soviet Union. Students will develop a high degree of competence in Russian history, politics, society, and culture as well as a basic competence in the Russian language and the broader Eurasian context.

Two required language courses (6 credits)

Other relevant advanced language courses may be used to fulfill this requirement with the prior written approval of the director. Majors are encouraged to take additional advanced Russian language courses.

- RUSS 250 - Gateway to Advanced Russian Credits: 3
- RUSS 380 - Advanced Russian I Credits: 3

Two courses (6 credits) of Russian or Soviet history chosen from:

When the topic is relevant, HIST 300, HIST 388, or HIST 499 may be used to fulfill this requirement with the prior written approval of the director.

- HIST 328 - Rise of Russia Credits: 3
- HIST 329 - Modern Russia and the Soviet Union Credits: 3
- HIST 426 - The Russian Revolution Credits: 3

Two courses (6 credits) of social sciences dealing primarily with Russia chosen from:

Any topically appropriate courses in any social science discipline (ANTH, ECON, GGS, GOVT, SOCI) may be used to fulfill this requirement with the prior written approval of the director.

- GOVT 338 - Government and Politics of Russia Credits: 3
- GGS 330 - Geography of the Soviet Succession States Credits: 3
- ECON 380 - Economies in Transition Credits: 3

**Two courses (6 credits) of Russian literature or culture chosen from:**

Other relevant courses may be used to fulfill this requirement with the prior written approval of the director.

- RUSS 302 - Russian Conversation and Composition Credits: 3
- RUSS 303 - Russian Advanced Conversation Credits: 3
- RUSS 310 - Readings in Russian Literature Credits: 3
- RUSS 311 - Contemporary Russian Short Fiction Credits: 3
- RUSS 325 - Major Russian Writers Credits: 3
- RUSS 326 - A Survey of Russian Literature Credits: 3
- RUSS 327 - A Survey of Russian Literature Credits: 3
- RUSS 353 - Russian Civilization Credits: 3
- RUSS 354 - Contemporary Post-Soviet Life Credits: 3

**Three courses at the 300 and 400 level (9 credits)**

Students choose from courses that focus predominantly on Eastern Europe, Russia, or Central Asia. Courses used to meet this requirement may be in any field of study including special topics courses and other courses that deal primarily with the geographic areas covered in the Russian and Eurasian studies major. To use a special topics course or other course with variable content to meet this requirement, students should seek the advanced written approval of the director. (Special topics courses may be repeated for credit when the topic is different.) Examples of courses that may meet this requirement:

- RUSS 302 - Russian Conversation and Composition Credits: 3
- RUSS 303 - Russian Advanced Conversation Credits: 3
- RUSS 310 - Readings in Russian Literature Credits: 3
- RUSS 311 - Contemporary Russian Short Fiction Credits: 3
- RUSS 325 - Major Russian Writers Credits: 3
- RUSS 326 - A Survey of Russian Literature Credits: 3
- RUSS 327 - A Survey of Russian Literature Credits: 3
- RUSS 353 - Russian Civilization Credits: 3
- RUSS 354 - Contemporary Post-Soviet Life Credits: 3
- RUSS 381 - Advanced Russian II Credits: 3
- RUSS 401 - Readings in the Social Sciences Credits: 3
- RUSS 407 - Russian Drama and Theater Credits: 3
- RUSS 410 - Russian Poetry Credits: 3
- RUSS 470 - Topics in (Post) Soviet Film Credits: 3
- RUSS 480 - Fourth-Year Russian Credits: 3
- RUSS 481 - Fourth-Year Russian Credits: 3
- HIST 300 - Introduction to Historical Method Credits: 3
- HIST 312 - Nationalism in Eastern Europe Credits: 3
- HIST 328 - Rise of Russia Credits: 3
- HIST 329 - Modern Russia and the Soviet Union Credits: 3
- HIST 387 - Topics in Global History Credits: 3
- HIST 388 - Topics in European History Credits: 3
- HIST 426 - The Russian Revolution Credits: 3
- HIST 499 - Senior Seminar in History Credits: 3
- THR 352 - Dramatic Literature Seminar Credits: 3
- ECON 380 - Economies in Transition Credits: 3
- GGS 330 - Geography of the Soviet Succession States Credits: 3
- GOVT 338 - Government and Politics of Russia Credits: 3
- GOVT 340 - Central Asian Politics Credits: 3
- GOVT 444 - Issues in International Studies Credits: 1-3
- GOVT 447 - Revolution and International Politics Credits: 3

Total: 33 credits

▲ Concentration in Russian Language and Culture (RULC)

Students in the Russian language and culture concentration develop a high degree of competence in Russian language and culture and a basic familiarity with Russian and Eurasian history and politics.

Three required courses (9 credits) in advanced Russian

- RUSS 380 - Advanced Russian I Credits: 3
- RUSS 381 - Advanced Russian II Credits: 3
- RUSS 480 - Fourth-Year Russian Credits: 3

Two courses (6 credits) in Russian culture or history

- RUSS 353 - Russian Civilization or HIST 328 - Rise of Russia Credits: 3
- RUSS 354 - Contemporary Post-Soviet Life or HIST 329 - Modern Russia and the Soviet Union Credits: 3

Two courses (6 credits) in Russian literature or cinema in translation, chosen from:

- RUSS 325 - Major Russian Writers Credits: 3
- RUSS 326 - A Survey of Russian Literature Credits: 3
- RUSS 327 - A Survey of Russian Literature Credits: 3
- RUSS 470 - Topics in (Post) Soviet Film Credits: 3

Three courses (9 credits) taught in Russian, chosen from:

- RUSS 302 - Russian Conversation and Composition Credits: 3
- RUSS 303 - Russian Advanced Conversation Credits: 3
- RUSS 310 - Readings in Russian Literature Credits: 3
- RUSS 311 - Contemporary Russian Short Fiction Credits: 3
- RUSS 401 - Readings in the Social Sciences Credits: 3
- RUSS 410 - Russian Poetry Credits: 3
- RUSS 481 - Fourth-Year Russian Credits: 3

One course (3 credits) in the social sciences chosen from:

Students choose from courses dealing with Russia. Any other topically appropriate course in a social science discipline (ANTH, ECON, GGS, GOVT, SOCI) may be used to fulfill this requirement with the prior written approval of the director.

- GOVT 338 - Government and Politics of Russia Credits: 3
- ECON 380 - Economies in Transition Credits: 3
- GGS 330 - Geography of the Soviet Succession States Credits: 3

Total: 33 credits

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in Russian and Eurasian studies may fulfill this requirement by successfully completing RUSS 302, 325, or 407.

■ Sociology and Anthropology

Phone: 703-993-1440
Web: soan.gmu.edu

Faculty

Emeritus faculty: Black, Dumont, Golomb, Williams (anthropology); Borkman (sociology)

Professors: Haines, Schiller, Seligmann, Williams (anthropology); Dennis, Jacobs, Kurtz, Witte, Scimecca (sociology)

Associate professors: Bickford, Trencher (chair) (anthropology); Best, Bockman, Dale, Guagnano, Hanrahan, Jacobs, Rader, Rosenblum, Samara (sociology)

Assistant professors: Benitez, Hughes, Mantz, Sadana (anthropology); Davis, Kim (sociology)

Term associate professor: Masters (sociology)

Adjuncts: Gerber (anthropology); Minnich, Nambiar, Pearlman, Sandole-Staroste (sociology)

Affiliate faculty: Avruch, Blum (anthropology); Goldstone, Johnson, Spalter-Roth (sociology)
Course Work

This department offers all course work designated ANTH, SOAN, and SOCI in the Courses chapter of this catalog.

Undergraduate Programs

Anthropology

The department offers a bachelor of arts degree in anthropology. The program draws broadly from the social sciences, humanities, and natural sciences, making it a strong undergraduate major that provides a sound interdisciplinary preparation for a variety of careers.

Honors in the Major

Highly qualified students majoring in anthropology may apply to graduate with honors in the major. To be eligible, students must have completed at least 60 credits, taken ENGH 302 for the social sciences, completed 15 credits of anthropology (including ANTH 114), and have a minimum cumulative GPA of 3.30 and a minimum grade of B+ in anthropology courses.

If accepted, students complete two honors courses. The first course is an honors section of one of these courses: ANTH 496, 410, 420, 430, 450, 495, or other course chosen in consultation with the honors director. The second course is ANTH 499, in which students complete an honors paper written under the guidance of an anthropology faculty member. All candidates for honors in the major participate in an honors colloquium. To graduate with honors in the major, students must complete the honors coursework with a minimum GPA of 3.50.

Bachelor’s/Accelerated Master’s Program

The department offers highly qualified majors in anthropology the opportunity to apply to an accelerated master’s degree program in anthropology. If accepted, students will be able to earn both the undergraduate and graduate degrees after satisfactory completion of 144 credits, sometimes within five years.

Sociology

The department offers a bachelor's degree in sociology. Sociology majors study how social movements emerge from the collective efforts of individuals and the role that social forces play in defining racial identities and gender roles. They take courses in the theories that explain social phenomena and develop strong research skills, learning how to conduct surveys, interviews, systematic observation as well as how to evaluate sources.

With the strong research skills, critical thinking, and effective writing that are the hallmark of sociology graduates, they are prepared for a variety of career paths from teaching, human service, and human resource occupations to work in the criminal justice system, marketing, and social research. The sociology major is also excellent preparation for students considering law school or graduate training in the social and behavioral sciences.

Honors in the Major

Highly qualified students majoring in sociology may apply to graduate with honors in the major. To be eligible, students must have completed at least 75 credits, taken ENGH 302 for the social sciences, completed 21 credits of sociology, and have a minimum cumulative GPA of 3.30 and a minimum grade of B+ in sociology courses. Applicants must have completed SOCI 303 and 311 with a minimum grade of B in each.
If accepted, to graduate with honors in sociology, students must complete SOCI 480 and 481 with a minimum grade of B+ in each of these courses and have an overall GPA of 3.50 in sociology courses presented for graduation. SOCI 481 includes completion of a honors thesis, which will be presented at a sociology colloquium.

**Bachelor’s/Accelerated Master’s Program**

The department offers highly qualified majors in sociology the opportunity to apply to an accelerated master’s degree program in sociology. If accepted, students will be able to earn both the undergraduate and graduate degrees after satisfactory completion of 144 credits, sometimes within five years.

**Minors**

The department offers minors in anthropology and sociology available to students in any major.

The department coordinates the interdisciplinary minor in Immigration Studies and the faculty participate in many other minors in the college. See the Minors and Interdisciplinary Minors section of this chapter for more information.

**Graduate Programs**

**Anthropology**

The department offers a master's degree in anthropology. Students can choose one of three emphases: advanced training in sociocultural anthropology; culture, health and bioethics; or transnational and global issues. They can choose from many courses that are richly interdisciplinary covering such diverse topics as nationalism and transnationalism; bioethics; social movements, ethnicity and identity; conflict and violence; migration, displacement, and refugees; regional ethnography; and political economy and globalization. Departmental specializations include the following regions: Central and South America, Europe, Africa, the Middle East, Asia, and the United States. Course work progresses from core courses to more advanced courses and culminates in a thesis.

**Sociology**

The department offers master's and doctoral degrees in sociology. Students pursuing a master’s degree in sociology take required courses in theory and methods and a host of electives. Students may choose to focus their electives in one of a number of emphases: sex and gender; crime, delinquency, and corrections; race and ethnicity; cultural studies; or conflict analysis and management.

The doctoral degree in sociology provides rigorous training in public and applied social research, including skills in research design, data analysis, and substantive areas that are pertinent to various sectors in the Washington, D.C., area. Graduates have the theoretical, analytical, and professional skills that prepare them for academic positions in teaching or research. They are also well-qualified for nonacademic positions in the many settings that rely on the expertise of sociologists including human service agencies, marketing research firms, educational systems, nonprofit foundations, and law enforcement agencies.

**Funding**

The department has a limited number of teaching assistantships, which are awarded on a competitive basis. Other sources of funding such as grants, loans, and employment on campus are also available. Students awarded assistantships must register for a minimum of six credits a semester and show satisfactory progress toward their degree.

**Cultural Studies**
The master's degrees in anthropology and sociology provide excellent preparation for students interested in pursuing a doctorate in cultural studies who do not already hold a master's degree. Within the master's in sociology, the emphasis in sociology of culture is designed explicitly to prepare students for the doctoral program in cultural studies.

Nondegree Status

Applicants who do not wish to pursue a degree may apply for nondegree status. Nondegree students must meet the same admission requirements as degree-seeking students (minimum undergraduate GPA of 3.00, among other criteria). Nondegree students may later apply for admission to a degree program. Up to nine credits earned in nondegree status may transferred to the master’s degrees in anthropology or sociology, subject to the approval of the program director and dean.

Undergraduate Degree

Anthropology, BA

Banner Code: LA-BA-ANTH
Web: soan.gmu.edu

Anthropology is the study of human beings and their cultures. The bachelor of arts degree in anthropology draws broadly from the social sciences, humanities, and natural sciences. It is a strong undergraduate major that provides a sound interdisciplinary preparation for a variety of careers.

This program of study is offered by the Department of Sociology and Anthropology. For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

Degree Requirements

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in anthropology must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 36 credits with a minimum GPA of 2.00.

Students are advised to consult with an advisor to learn how they can fulfill general education requirements in global understanding, information technology, and synthesis, as well as the college-level requirement in non-Western culture.

Four core courses (12 credits)

SOCI 311 may substitute for ANTH 390.

- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
- ANTH 120 - Unearthing the Past: Prehistory, Culture and Evolution Credits: 3
- ANTH 390 - Theories, Methods, and Issues I Credits: 3
- ANTH 490 - Theories, Methods, and Issues II Credits: 3

Eight elective courses (24 credits):
Students choose electives from ANTH courses at the 300- and 400-level. Students may use two SOCI courses as electives: SOCI 311 (if not used as a substitute for core course ANTH 390) and 313.

Students wishing to pursue careers in anthropology should consider taking ANTH 492 (or subfield specialty equivalents, such as ANTH 420, 450, 495, or 496) as one of their electives.

**Total: 36 credits**

**Writing-Intensive Requirement**

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in anthropology may fulfill this requirement by successfully completing ANTH 490.

**Sociology, BA**

**Banner Code: LA-BA-SOCI**

Web: soan.gmu.edu

Sociology involves the systematic study of social structures, cultural patterns, and human relationships. The sociological imagination combines rigorous methods with theory and observation, yielding insights that challenge commonly held assumptions about the social world. Sociology also informs the practice of social and public service, aiding efforts to address important social problems. Majoring in sociology positions students so they can pursue a varied set of career paths, ranging from teaching, human service, and human resource occupations to positions in the criminal justice system, marketing, and social research. The sociology major is excellent preparation for students considering law school or graduate training in the social and behavioral sciences.

This program of study is offered by the Department of Sociology and Anthropology.

For policies governing all undergraduate degrees, see the Academic Policies chapter of this catalog.

**Degree Requirements**

Students must fulfill all requirements for bachelor's degrees, including university general education requirements. Students pursuing a BA in sociology must complete additional college requirements for the BA degree in the College of Humanities and Social Sciences. Students pursuing this degree must complete 35 credits of sociology courses with a minimum GPA of 2.00. No more than 6 credits of courses with unsatisfactory grades (C- or D) may be applied toward the degree.

**One introductory core course (3 credits)**

The introductory course must be completed with a minimum grade of 2.00.

- SOCI 101 - Introductory Sociology Credits: 3

**Four additional core courses (14 credits)**

Each of these courses must be completed with a minimum grade of 2.00.
Electives (18 credits)

Students complete 18 credits in sociology at the 300 or 400 level. Students are strongly encouraged to focus four of their elective courses (12 credits) in one of the concentrations below chosen to suit their interests and career objectives. Students who choose a concentration will complete two remaining electives.

Concentrations

Students can focus 12 of their 18 elective credits to complete one of the following 12-credit concentrations.

Students who graduate with honors in sociology may apply 3 credits of honors course work to their selected concentration where appropriate and with prior written approval of the undergraduate director.

▲ Concentration in Childhood and Youth (CYC)

This concentration focuses on the changing social realities, experiences, and identities of children and youth as they are formed in different social and historical contexts. It emphasizes children in peer groups, youth subcultural activities, youth and children and the media, schools, families, social movements, social policy, and the welfare state. This concentration is appropriate for students interested in working directly with children and youth or in organizations serving them in a broad range of fields, such as educational counseling, teaching, policy, advocacy or clinical work, family and community services, social work, early child development, and juvenile justice.

One required course (3 credits)

- SOCI 360 - Youth Culture and Society Credits: 3

Three courses (9 credits) chosen from:

- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 307 - Social Movements and Political Protest Credits: 3
- SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
- SOCI 315 - Women and Men in Society Credits: 3
- SOCI 382 - Education in Contemporary Society Credits: 3
- SOCI 395 - Special Topics in Sociology Credits: 3
- SOCI 483 - The Sociology of Higher Education Credits: 3
- ANTH 315 - Socialization Processes: Family, Childhood, Personality in Cross-Cultural Perspective Credits: 3

Total: 12 credits
▲ Concentration in Deviance, Crime, and Social Control (DCSC)

This concentration focuses on the social, legal, and political systems that underpin social control in Western societies and beyond. The emphasis is on how norms, values, and common sense regulate human action and the social forces that produce deviant behavior and societal responses to it. This concentration is appropriate for students interested in the criminal justice system and the law.

One required course (3 credits)

- SOCI 300 - Social Control and Freedom Credits: 3

Three courses (9 credits) chosen from:

- SOCI 301 - Criminology Credits: 3
- SOCI 302 - Sociology of Delinquency Credits: 3
- SOCI 307 - Social Movements and Political Protest Credits: 3
- SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
- SOCI 310 - Sociology of Deviance Credits: 3
- SOCI 332 - The Urban World Credits: 3
- SOCI 340 - Power, Politics, and Society Credits: 3
- SOCI 352 - Social Problems Credits: 3
- SOCI 355 - Social Inequality Credits: 3
- SOCI 395 - Special Topics in Sociology Credits: 3 (depending on topic)

Total: 12 credits

▲ Concentration in Global Sociology (GSOC)

This concentration focuses on global interconnectedness and its effect on the nature of societies around the world. It emphasizes new technologies and social processes, migration, transnational communities, global cities, and social movements working across state borders. This concentration is appropriate for students interested in pursuing internationally oriented careers in social change, political reform, and international development.

One required course (3 credits)

- SOCI 320 - Social Structure and Globalization Credits: 3

Three courses (9 credits) chosen from:
• SOCI 307 - Social Movements and Political Protest Credits: 3
• SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
• SOCI 326 - Armed Conflict and Conflict Resolution Credits: 3
• SOCI 332 - The Urban World Credits: 3
• SOCI 340 - Power, Politics, and Society Credits: 3
• ANTH 332 - Cross-cultural perspectives on globalization Credits: 3

Total: 12 credits

▲ Concentration in Inequality and Social Change (INSC)

The focus is on inequalities, such as those of race, class, and sex, and on the manner in which such inequalities become structurally rooted in a society. The emphasis is on understanding the rise of the struggle for human rights, democracy, and various social movements that have sought to reverse these inequalities through protests, demonstrations, counterorganizations, and the ballot. This concentration is appropriate for students who seek careers in social justice organizations, social services, or teaching, and those who wish to participate in social and political movements.

One required course (3 credits)

• SOCI 355 - Social Inequality Credits: 3

Three courses (9 credits) chosen from:

• SOCI 300 - Social Control and Freedom Credits: 3
• SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
• SOCI 310 - Sociology of Deviance Credits: 3
• SOCI 315 - Women and Men in Society Credits: 3
• SOCI 332 - The Urban World Credits: 3
• SOCI 340 - Power, Politics, and Society Credits: 3
• SOCI 360 - Youth Culture and Society Credits: 3
• SOCI 390 - Sociology of Health, Illness, and Disability Credits: 3
• SOCI 395 - Special Topics in Sociology Credits: 3 (depending on topic)

Total: 12 credits

Total: 35 credits
Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students majoring in sociology may fulfill this requirement by successfully completing SOCI 412.

Undergraduate Interdisciplinary Minor

Immigration Studies Minor

Banner Code: IMMS
Phone: 703-993-1178
Web: immigrationstudies.gmu.edu

Faculty

Cleaveland, Haines, Ihara, Leeman, Rabin, Ritchie, Seligmann, Shutika, Trencher (director)

The minor in immigration studies combines perspectives from the humanities and social sciences to provide an interdisciplinary and comparative understanding of the immigrant experience, ethnic identity, assimilation, ethnic exclusion and conflict, and refugee situations.

This program of study is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 15 credits of coursework with a minimum GPA of 2.00.

One required course (3 credits)

- ANTH 340 - Comparative Perspectives on Immigration Credits: 3

One course (3 credits) focused on ethnicity in the United States chosen from:

- SOCI 308 - Race and Ethnicity in a Changing World Credits: 3
- ENGH 352 - Topics in Ethnic American Literature Credits: 3
- ENGH 416 - Ethnicity and Migration in Folklore Credits: 3

One course (3 credits) focused on global perspectives on migration and ethnicity chosen from:
- ANTH 331 - Refugees Credits: 3
- GOVT 445 - Human Rights Credits: 3
- CONF 302 - Culture, Identity, and Conflict Credits: 3

Two elective courses (6 credits) chosen from:

- FRLN 385 - Multilingualism, Identity, and Power Credits: 3
- NCLC 361 - Neighborhood, Community, and Identity Credits: 3-6
- SOCI 332 - The Urban World Credits: 3
- SPAN 430 - Spanish in the United States Credits: 3

Total: 15 credits

Undergraduate Minor

Anthropology Minor

Banner Code: ANTH

Web: soan.gmu.edu

This program of study is offered by the Department of Sociology and Anthropology.

For policies governing all minors see the Academic Policies chapter of this catalog.

Course Work

Students pursuing this minor must complete 18 credits in anthropology with a minimum GPA of 2.00.

Two required courses (6 credits):

- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
  and
- ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3
  or
- ANTH 120 - Unearthing the Past: Prehistory, Culture and Evolution Credits: 3

One regional ethnography course (3 credits) chosen from:
• ANTH 301 - Native North Americans Credits: 3
• ANTH 302 - Peoples and Cultures of Latin America Credits: 3
• ANTH 304 - Peoples and Cultures of the Pacific Credits: 3
• ANTH 306 - Peoples and Cultures of Island Asia Credits: 3
• ANTH 307 - Ancient Mesoamerica Credits: 3
• ANTH 308 - Peoples and Cultures of the Middle East Credits: 3
• ANTH 309 - Peoples and Cultures of India Credits: 3
• ANTH 311 - Peoples and Cultures of Mainland Southeast Asia Credits: 3
• ANTH 330 - Peoples and Cultures of Selected Regions: Non-Western Credits: 3

Three elective courses in anthropology at the 300- or 400- level (9 credits)

Total: 18 credits

Sociology Minor

Banner Code: SOCI

Web: soan.gmu.edu

This program of study is offered by the Department of Sociology and Anthropology.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Two required courses (6 credits)

Students must complete each of these courses with a minimum grade of 2.00.

• SOCI 101 - Introductory Sociology Credits: 3
• SOCI 311 - Classical Sociological Theory Credits: 3

Four elective courses (12 credits)

Students may focus the coursework for their minor by choosing electives from one of the five concentrations offered as part of the BA in sociology.

Total: 18 credits
Bachelor's/Accelerated Master's Program

Anthropology, BA/Anthropology, Accelerated MA

Web: soan.gmu.edu

Highly-qualified Mason anthropology majors may apply to the accelerated master's degree program. If accepted, students will be able to earn both a BA and a MA in anthropology after satisfactory completion of 144 credits, sometimes within 5 years. Students with both a BA and MA have a competitive advantage when applying to PhD programs in anthropology.

This program of study is offered by the Department of Sociology and Anthropology.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in anthropology, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements

While undergraduate students, accelerated master's students complete the two graduate courses indicated on their Accelerated Master's Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor's/Accelerated Master's Transition Form and are admitted to graduate status.

As graduate students, accelerated master's students have an advanced standing. They must meet all master's degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master's program the semester immediately following conferral of the undergraduate degree.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition Form.

Sociology, BA/Sociology, Accelerated MA

Web: soan.gmu.edu
Highly qualified Mason sociology majors may apply to the accelerated master's degree program. If accepted, students will be able to earn both a BA and an MA in sociology following satisfactory completion of 144 credits, sometimes within five years.

This program of study is offered by the Department of Sociology and Anthropology.

For policies governing all graduate degrees, see the Academic Policies chapter of this catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the accelerated MA in sociology, see Application Requirements and Deadlines on the departmental web site.

**Degree Requirements**

While undergraduate students, accelerated master’s students complete the two graduate courses indicated on their Accelerated Master’s Program Application with a minimum grade of 3.00 in each course. They must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor’s/Accelerated Master’s Transition Form and are admitted to graduate status.

As graduate students, accelerated master’s students have an advanced standing. They must meet all master’s degree requirements except for the two courses (6 credits) they completed as undergraduates. Students must begin their master’s program the semester immediately following conferral of the undergraduate degree.

**Reserve Graduate Credit**

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation.

To apply these credits to the master’s degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor’s/Accelerated Master’s Transition Form.

**Master's Degree**

**Anthropology, MA**

*Banner Code: LA-MA-ANTH*

*Web: soan.gmu.edu*

The master’s degree program in anthropology prepares students for advanced work in anthropology through courses focusing on the study of culture. Students learn how to use participant-observation field work methods, as well as comparative and holistic knowledge and research methods. Areas of emphasis are advanced training in sociocultural anthropology; culture, health and bioethics; museums and anthropology; and transnational and global issues. Course work progresses from core courses to more advanced courses and culminates in a thesis or a project.
This program of study is offered by the Department of Sociology and Anthropology.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

**Application Requirements**

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in anthropology, see Application Requirements and Deadlines on the departmental web site.

**Satisfactory Progress**

According to university policy, students may be terminated if they fail to achieve satisfactory progress toward their degree. Students in the MA in anthropology degree program are judged as having failed to achieve satisfactory progress toward their degree for the following reasons:

- two consecutive semesters in which academic warnings appear on their transcript
- failure to successfully complete ANTH 535, 536, 650 within 4 semesters of first enrolling as degree-seeking students in the MA in anthropology program
- failure to enroll in graduate coursework in anthropology for 2 consecutive semesters, unless there are compelling reasons for not having done so

Like all academic policies, these provisions take effect with the publication of this catalog and apply to all graduate students in the MA in anthropology regardless of their calendar year.

**Degree Requirements**

Courses in archaeology and biological anthropology may not be used to meet any requirements for the master's degree in anthropology.

**Four required core courses (12 credits)**

- ANTH 535 - Anthropology and the Human Condition: Seminar I Credits: 3
- ANTH 536 - Anthropology and the Human Condition: Seminar II Credits: 3
- ANTH 650 - Ethnographic Methods and Research Design Credits: 3
- ANTH 798 - Thesis Proposal Credits: 1-6

**Elective courses (15 credits)**

Electives should be advanced courses in anthropology chosen in consultation with an advisor. Students can choose to focus their electives around an emphasis in these four areas: advanced training in sociocultural anthropology; culture, health and bioethics; museums and anthropology; or transnational and global issues. Up to six credits may be from other disciplines with the prior written approval of the graduate director.

Students may take ANTH 690 - Internship Credits: 3-6 as elective credit. An internship can serve as a primary field research site for the thesis.
Thesis (3 credits) or Research Project (3 credits)

Students should be aware of the policies governing theses. They must follow the thesis enrollment policy of the university and once enrolled in ANTH 799, maintain continuous enrollment. These policies are specified in the Academic Policies chapter of the catalog.

- ANTH 796 - Master’s Research Project Credits: 1-6
  or
- ANTH 799 - Master's Thesis Credits: 1-6

Total: 30 credits

Sociology, MA

Banner Code: LA-MA-SOCI

Web: soan.gmu.edu

The MA in sociology provides opportunities for students to develop expertise in a variety of areas including applied methods, community, conflict analysis and management, development and social change, deviance, environmental sociology, gerontology, medical sociology, occupations and professions, policy analysis, race and ethnicity, sociology of science and technology, cultural studies, and survey research. The program is strongly connected to various nonprofit and community groups, providing ample opportunity for research, internships, and employment in various occupations.

Students pursuing a MA in sociology may choose an emphasis in general sociology; sex and gender; crime, delinquency, and corrections; race and ethnicity; cultural studies; or conflict analysis and management. The general sociology emphasis allows maximum flexibility in the application of sociological knowledge to the analysis of social processes and systems. All emphases are appropriate for those anticipating further graduate study leading to the doctorate in sociology.

Designed as a small and selective graduate program, the MA enables students to enjoy the benefits of a personal mentoring experience as they gain skills in both basic and applied research. In addition to required and elective coursework, students are required to complete a master’s thesis to demonstrate their ability to carry out independent research. The thesis consists of a substantial sociological research or theoretical project that will contribute to sociological knowledge.

This program of study is offered by the Department of Sociology and Anthropology.

For policies governing all graduate degrees, see the Academic Policies chapter of this catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the MA in sociology, see Application Requirements and Deadlines on the departmental web site.

Degree Requirements
Two courses (6 credits) of social theory

- SOCI 711 - Classical Sociological Theory Credits: 3
- SOCI 712 - Contemporary Sociological Theory Credits: 3

Three courses (9 credits) of research methods

- Two courses (6 credits) chosen in consultation with an advisor
  and
- SOCI 620 - Methods and Logic of Social Inquiry Credits: 3

Four to five elective courses (12 to 15 credits)

Students may choose their electives from the full range of offerings in sociology (any SOCI course) or focus nine credits of electives in one of five emphases.

Emphasis in Sex and Gender

- 6 credits in sex and gender chosen in consultation with an advisor
- SOCI 605 - Gender and Social Structure Credits: 3

Emphasis in Conflict Analysis and Management

- 9 credits in the sociology of conflict and conflict management chosen in consultation with an advisor

Emphasis in Race and Ethnicity

- 9 credits in race and ethnicity chosen in consultation with an advisor

Emphasis in Crime, Delinquency, and Corrections

- SOCI 607 - Criminology Credits: 3
- SOCI 608 - Juvenile Delinquency Credits: 3
- SOCI 609 - Sociology of Punishment and Corrections Credits: 3

Emphasis in Sociology of Culture

This emphasis prepares students for the doctoral program in cultural studies.

- one master’s-level course (3 credits) in a department other than Sociology and Anthropology that serves as an introduction to cultural studies
• SOCI 614 - Sociology of Culture Credits: 3  
• CULT 802 - Histories of Cultural Studies Credits: 3

Thesis (3 or 6 credits)

A master’s thesis demonstrates the student's capacity to carry out independent research. The thesis consists of a substantial sociological research or theoretical project that will contribute to the advancement of knowledge in sociology.

Students must follow the thesis enrollment policy of the university and once enrolled in SOCI 799, maintain continuous enrollment as specified in the Academic Policies chapter of the catalog.

• SOCI 799 - Thesis Credits: 1-6

Total: 33 credits

Doctoral Degree

Sociology, PhD

Banner Code: LA-PHD-SOCI

Web: soan.gmu.edu

The doctoral degree in sociology provides rigorous training in public and applied social research, including skills in research design, data analysis, and substantive areas that are pertinent to various sectors in the Washington, D.C. area. Graduates have the theoretical, analytical, and professional skills that prepare them for academic positions in teaching or research. They are also well-qualified for nonacademic positions in the many settings that rely on the expertise of sociologists including human service agencies, marketing research firms, educational systems, nonprofit foundations, and law enforcement agencies.

This program of study is offered by the Department of Sociology and Anthropology.

For policies governing all graduate degrees, see the Academic Policies chapter of this catalog.

Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the PhD in sociology, see Application Requirements and Deadlines on the departmental web site.

Reduction of Credit

Students who enter the program with a master’s degree may be allowed a reduction of credit up to 30 credits subject to the approval of the graduate director and the dean.
Degree Requirements

Students pursuing this degree must complete a minimum of 72 graduate credits. The requirements include foundation courses in theory and methods, course work in a specialization, and electives. Following completion of all required course work and passing a candidacy exam, students are advanced to candidacy by the dean and complete a dissertation, an original and independent research project.

Eight foundation courses (24 credits)

One required foundation course (3 credits)

- SOCI 801 - Proseminar in Public and Applied Sociology Credits: 3

Two courses of theory (6 credits)

- SOCI 711 - Classical Sociological Theory Credits: 3
- SOCI 712 - Contemporary Sociological Theory Credits: 3

Two required courses of methodology and analysis (6 credits)

- SOCI 620 - Methods and Logic of Social Inquiry Credits: 3
- SOCI 636 - Statistical Reasoning Credits: 3

One elective course of methodology and analysis (3 credits) chosen from:

- SOCI 730 - Analytic Techniques of Social Research Credits: 3
- SOCI 634 - Qualitative Research Methods Credits: 3

Two courses of statistics/methods (6 credits) chosen from:

- SOCI 631 - Survey Research Credits: 3
- SOCI 632 - Evaluation Research for Social Programs Credits: 3
- SOCI 634 - Qualitative Research Methods Credits: 3
• PUBP 704 - Statistical Methods in Policy Analysis Credits: 3
• PUBP 705 - Advanced Statistical Methods in Policy Analysis Credits: 3
• ANTH 650 - Ethnographic Methods and Research Design Credits: 3
• WMST 610 - Feminist Approaches to Social Research Credits: 3

Two proseminars (6 credits)

• SOCI 803 - Institutions and Inequality Credits: 3
• SOCI 804 - Sociology of Globalization Credits: 3

Three courses (9 credits) in a specialization

Students specialize in either institutions and inequalities or sociology of globalization. Depending on the topic, special topics courses SOCI 633 and SOCI 833 (or others) may be applied to the specialization with prior written approval of the director. Up to two courses (6 credits) may be from outside sociology, chosen in consultation with (and with approval of) the student’s advisor or the graduate director.

Institutions and inequalities specialization

Students complete 3 courses (9 credits) toward the degree, chosen from:

• SOCI 605 - Gender and Social Structure Credits: 3
• SOCI 840 - Work Organizations and Social Inequality Credits: 3
• SOCI 844 - Youth, Schooling, and Popular Culture Credits: 3
• SOCI 845 - Society and Education Credits: 3
• PUAD 651 - Virginia Politics, Policy, and Administration Credits: 3
• PUAD 750 - Federalism and Intergovernmental Relations Credits: 3
• GOVT 852 - Seminar in Political Leadership Credits: 3
• WMST 610 - Feminist Approaches to Social Research Credits: 3
• WMST 611 - Gender Research Project Credits: 3
• SOCI 633 - Special Topics in Sociology Credits: 3 (with prior written approval of director)
• SOCI 833 - Special Topics in Sociology Credits: 3 (with prior written approval of director)

Sociology of Globalization specialization

Students in this specialization must demonstrate proficiency in one foreign language at an advanced level of reading and comprehension. Students complete 3 courses (9 credits) toward the degree, chosen from:

• SOCI 850 - Sociology of Development Credits: 3
• SOCI 851 - Globalization and Social Movements Credits: 3
• SOCI 853 - Cities in a Global Society Credits: 3
• SOCI 857 - Sociology of Human Rights Credits: 3
• ANTH 631 - Refugees in the Contemporary World Credits: 3
• ANTH 632 - International Migration in Comparative Perspective Credits: 3
ANTH 655 - Nationalism, Transnationalism, and States: Local and Global Perspectives Credits: 3
CONF 736 - Globalization and International Conflict Credits: 3
PUBP 602 - Regional Economic Development: Strategies and Applications Credits: 3
PUBP 758 - Global Threats and Medical Policies Credits: 3
SOCI 633 - Special Topics in Sociology Credits: 3 (with prior written approval of director)
SOCI 833 - Special Topics in Sociology Credits: 3 (with prior written approval of director)

Six elective courses (18 credits)

Electives may include up to two courses (6 credits) from outside sociology, chosen in consultation with and approval of the graduate director.

Research Proficiency

Students must demonstrate proficiency in a range of quantitative and qualitative research methods prior to taking the qualifying exams for candidacy. Proficiency is determined by satisfactory course work or an exam.

Dissertation (15 credits)

Once enrolled in 998, students in this degree program must maintain continuous registration for at least 1 credit. Once enrolled in 999, students must maintain continuous registration each semester (excluding summers) until the dissertation is submitted to and accepted by the University Libraries. Once enrolled in 999, students must follow the university’s continuous registration policy as specified in the Academic Policies chapter of the catalog. Students who defend in the summer must be registered for at least 1 credit of 999.

Students complete a minimum of 3 credits of 998 and 3 credits of 999. They may apply a maximum of 15 dissertation credits (998 and 999 combined) to the degree. Because of the continuous registration policy, students may be required to register for additional credits of these courses.

- SOCI 998 - Doctoral Dissertation Proposal Credits: 1-9 (minimum of 3 credits)
- SOCI 999 - Doctoral Dissertation Credits: 1-12 (minimum of 3 credits)

Total: 72 credits

Advancement to Candidacy

To advance to candidacy, students must complete all course work required on their approved program of study. Students must also successfully pass two written qualifying examinations. One examination is in the foundations of sociological inquiry, linking research methods and sociological theory to public concerns. The second examination (a field statement) is in the student’s area of specialization, administered by a faculty committee appointed by the graduate program director. Additionally, students must have an approved dissertation committee. Evidence of completed requirements must be on file in the Dean's Office before a student can advance to candidacy.

Women and Gender Studies
Faculty

Amireh, Baily, Baker, Beach, Bergoffen, E. Bernard, Best, Burt, Carbonneau, Cattaneo, Censer, Cheldelin, Chen, Cherubin, Chollar, Christensen, Constantine, Copelman, Davidson, Dakake, Davis, Deshmukh, Dunne, Eby, Eckenwiler, Feerick, Garner, Gil Gorski, Hamdani, Hanrahan, Harvey, Hirsch, Hodges, Hughes, Jadallah, Jenkins, Johnsen-Neshati, Jordan, Kaplan, Karametou, King, Kirsch, Koch, Kravitz, Lindley, Lockwood, Masters, McNeely, Michals, Mink, Misencik, Muir, Pascarell, Peters Burton, Photos, Portillo, Regan, Reybold, Ricouart, Rosenblum, Rosenberger, Sandell, Sandole-Staroste, Schwartzstein, Scott (director), Seligmann, Snyder-Hall, Stearns, Tichy, Todd, Travis, Vivancos Perez, Wagner, Yocom, Zawacki

Course Work

The Women and Gender Studies Program offers all course work designated WMST in the Courses chapter of this catalog.

About Women and Gender Studies at Mason

By choosing to pursue work in women and gender studies, students at all levels engage in an interdisciplinary exploration of gender in social, political, cultural, and economic life; gender in history; women and the media; feminist theory; the relationship between sex and gender; the impact of sex, race, class, disability, and sexual orientation on people’s lives; and the ways in which gender stereotypes influence the self in relationship to others. Students in many courses have the opportunity to investigate these issues in a cross-cultural and global perspective.

Undergraduate Programs

The Women and Gender Studies Program offers an interdisciplinary minor open to students from any major. Students have the opportunity to earn credit toward the minor while doing an internship that helps prepare them for the work place, a service learning course that combines work in a specific course with a service project, or research on gender issues on Mason's campus. Students pursuing this minor can take advantage of the many activities and resources provided by the Women and Gender Studies Center.

Graduate Programs

The program sponsors the concentration in women and gender studies in the master’s degree in interdisciplinary studies (MAIS). This concentration promotes advanced scholarship that transcends traditional disciplinary boundaries. Students combine required coursework in women and gender studies with courses in a discipline of interest such as history, literature, sociology, anthropology, health, education, public policy, philosophy, social work, conflict analysis and resolution, environmental science, and the arts. See Interdisciplinary Studies, MAIS section of this chapter.

The program also offers a graduate certificate in women and gender studies. Students may take this as a stand-alone certificate or pursue it concurrently with any graduate degree program. A portion of the certificate course work may be applied to the degree with the approval of the director of the graduate degree and dean. Students must apply and be accepted to a graduate certificate program.

Women and Gender Studies Center
The academic program in women and gender studies is integrated with the Women and Gender Studies Center. The center organizes a wide variety of lectures, conferences, workshops, and other public events throughout the year. The center houses a library and functions as a community space for students and faculty. It supports the Gender Justice Research Community, a monthly forum for research on gender and global human rights, the Global Arts and Culture Research Community, and many other groups of interest to students, faculty, and staff.

**Undergraduate Interdisciplinary Minor**

**Women and Gender Studies Minor**

**Banner Code:** WGST

Web: wmst.gmu.edu

The minor is for students who are interested in gender, sexuality, and feminist perspectives. While it is an especially good complement to a major in the humanities, social sciences, health and human services, or natural sciences, it is open to students in any major in the university.

The interdisciplinary minor in women and gender studies consists of two required courses and four electives. Students interested in feminist and gender issues choose their elective courses from a broad range of offerings. Those who wish to focus on LGBTQ (lesbian, gay, bisexual, transgender, and queer issues) issues, take an introductory course focused on these issues and two electives that incorporate more specifically such perspectives.

This program of study is offered by the Women and Gender Studies Program.

For policies governing all minors, see the Academic Policies chapter of this catalog.

**Course Work**

Students pursuing this minor must complete 18 credits with a minimum GPA of 2.00 in the minor.

**One introductory course (3 credits) chosen from:**

- WMST 200 - Introduction to Women and Gender Studies Credits: 3
- WMST 308 - Introduction to Lesbian, Gay, Bisexual, Transgender, Transsexual, and Queer Studies Credits: 3

**One theory course (3 credits)**

- WMST 330 - Theoretical Perspectives in Women and Gender Studies Credits: 3

**Elective courses (12 credits) chosen from:**
Note: for students who choose a focus on LGBTQ, two of the four electives must be approved for that focus by the undergraduate advisor.

- any WMST course
- CHIN 328 - Asian American Women Writers Credits: 3
- HEAL 325 - Health Aspects of Human Sexuality Credits: 3
- HEAL 327 - Women's Health Credits: 3
- HIST 350 - U.S. Women's History Credits: 3
- PSYC 362 - Psychology of Women Credits: 3
- PSYC 466 - Psychology of Intimate Relationships Credits: 3
- NCLC 310 - Violence and Gender Credits: 3-6
- NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film Credits: 3-6
- NCLC 317 - Issues in Family Relationships Credits: 4
- NCLC 320 - Construction of Differences: Race, Class, and Gender Credits: 6
- NCLC 346 - Art as Social Action Credits: 4
- NCLC 347 - Gender Representation in Popular Culture Credits: 3-6
- NCLC 400 - Temptress: Constructs of Sex and Power Credits: 3
- NCLC 405 - Women and Leadership Credits: 4
- NCLC 446 - Art, Beauty, and Culture Credits: 3-6
- SOCI 309 - Marriage, Families, and Intimate Life Credits: 3
- SOCI 315 - Women and Men in Society Credits: 3
- SOCI 355 - Social Inequality Credits: 3

Total: 18 credits

Master's Level Certificate

Women and Gender Studies Graduate Certificate

Banner Code: LA-CERG-WGST

Web: wmst.gmu.edu

The graduate certificate in women and gender studies may be taken alone or in conjunction with another graduate program. Courses applied to the certificate may be applied to a degree program, subject to approval of the director of the respective program.

This program of study is offered by Women and Gender Studies Program.

For policies governing all graduate certificates, see the Academic Policies chapter of this catalog.

The graduate certificate in women and gender studies may be pursued on a part-time or full-time basis.

Application Requirements
Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Admission chapter of this catalog. For information specific to the graduate certificate in women and gender studies, see Application Requirements and Deadlines on the departmental web site.

**Transfer Credit**

In accordance with university policy, students may transfer up to 3 graduate credits earned at another accredited institution to the certificate program with the approval of the director of the program and the dean. They may transfer up to 9 graduate credits earned at Mason in nondegree status toward the certificate, subject to approval of the director and the dean in accordance with university policy.

**Certificate Requirements**

**Two required courses (6 credits)**

- WMST 630 - Feminist Theories across the Disciplines Credits: 3
- WMST 640 - Women and Global Issues Credits: 3

**Three elective courses (9 credits)**

Students choose from relevant courses subject to the approval of the director. These courses may be from departments across the university that address the study of women and gender, courses in the Women and Gender Studies Program, and appropriate directed readings or independent study courses.

**Capstone portfolio**

Students synthesize their work in the certificate program by reflecting on how issues, ideas, and theories raised in the core courses inform their understanding of gender issues within their area of interest. The portfolio includes three to five items produced in previous course work and a 7-10 page essay discussing them. The portfolio may include course papers, performance videos, photos of exhibits, music, or other items as agreed on by the student and advisor. The portfolio must be approved by the graduate advisor and submitted to the Women and Gender Studies Program, where it will be presented, displayed, and archived.

**Total: 15 credits**
Krasnow Institute for Advanced Study

Krasnow Institute for Advanced Study

Phone: 703-993-4333  
Web: krasnow.gmu.edu  
College Code: KR

Administration

James L. Olds, Director  
Kenneth De Jong, Associate Director  
James L. Olds, Chair, Department of Molecular Neuroscience  
Robert Axtell, Chair, Department of Computational Social Science

Faculty

Ascoli, Axtell, Barreto, Blackwell, Butler, Cebral, Cioffi-Revilla, Cox, Cressman, Crooks, De Jong, Dumas, Gero, Gill, Kabbani, Kalbfleisch, Krueger, McCabe, Morowitz, Olds, Palkovich, Parasuraman, Peixoto, Sikdar, So, Tsvetovat

The Institute

The Krasnow Institute for Advanced Study seeks to expand the understanding of mind, brain, and intelligence by conducting research at the intersection of the separate fields of cognitive psychology, neurobiology, and the computer-driven study of artificial intelligence and complex adaptive systems, including social systems. These separate disciplines increasingly overlap and promise progressively deeper insight into human thought processes. The institute also examines how new insights from cognitive science research can be applied for human benefit in the areas of mental health, neurological disease, education, computer design, and social system analysis.

The Krasnow Institute for Advanced Study was chartered in 1990 as a private nonprofit Virginia corporation and merged with Mason in 2002, becoming a chartered institute under the Office of the Provost. The Center for Social Complexity joined the Krasnow Institute in 2005. In 2008, the institute became an academic unit housing the Molecular Neuroscience Department and the Computational Social Science Department. With an annual budget of $5.8 million, the institute is home to a scientific staff of over 100. Cognitive research at the institute spans from molecules to the mind to social systems. Krasnow scientists have published extensively in the most prestigious scholarly journals and collectively have brought in more than $45 million in sponsored research from federal agencies such as the National Institutes of Health and private sources such as the Sir John Templeton Foundation.

Academic Policies

Students should become familiar with the university's general academic policies in addition to those specific to each academic unit. Please see the Academic Policies section of this catalog.

Computational Social Science
Computational Social Science is the interdisciplinary science of complex social systems and their investigation through computational models and related tools. The field is at the intersection of social science and computer science and spans anthropology, economics, political science, sociology, and social psychology—the classical social sciences—as well as allied disciplines such as geography, history, organization theory, regional science, communication, and linguistics. Computational approaches include agent-based social simulation models (multi-agent systems), social network analysis, mathematical analysis based on complexity theory, social geospatial modeling methods, and automated information and content analysis methods.

The department offers a PhD degree, sponsors the computational social science concentration in the Master of Arts in Interdisciplinary Studies (MAIS) program, and offers a graduate level certificate.

**Master's Level Certificate**

**Computational Social Science Graduate Certificate**

*Banner Code: KR-CERG-CSS*

This 15-credit program is designed for students who seek training in computer simulation and related computational methods for analyzing social systems and processes. The program is open to all students with graduate standing at Mason and all students who hold a bachelor’s degree from an accredited university. The CSS certificate allows students with social science or computational backgrounds to acquire new knowledge and modeling skills to improve their qualifications and attractiveness to employers in government, academia, or industry. The core courses provide a common foundation; additional elective courses allow for a variety of student interests across diverse social domains.

**Admission Requirements**

Applicants should have an undergraduate degree from an accredited institution, with a GPA of at least 3.00. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, and a current résumé to the CSS Academic Programs Office. TOEFL scores are required of all international applicants. Applicants should read the full description of university-wide graduate admissions requirements in the Admission section of this catalog.

CSS Academic Programs Office  
Rm 382 Research I Bldg  
4400 University Drive, MS 6B2  
Fairfax, VA 22030

Students intending to obtain the CSS certificate must apply to the CSS certificate program before beginning any CSS course work intended to satisfy requirements. They must also have their course work plan approved by the director.

The graduate certificate in CSS may be pursued on a part-time or full-time basis.

**Certificate Requirements**

Two required core courses (6 credits)
CSS 600 - Introduction to Computational Social Science Credits: 3
CSS 610 - Computational Analysis of Social Complexity Credits: 3

Elective courses (minimum 9 credits)

An elective course may be any Mason master’s-level course in computational social science, social science, computer science, statistics, and other quantitative methods such as data visualization, information technology, and geographic information science. These courses should be selected in conjunction with, and approved by, the student’s advisor. CSS recommended courses include:

- CSS 605 - Object-Oriented Modeling in Social Science Credits: 3
- CSS 620 - Origins of Social Complexity Credits: 3
- CSS 692 - Social Network Analysis Credits: 3

Note: Students may include a maximum of 3 credits of programming courses to meet the elective requirements. Procedural, object-oriented languages, or other approved programming approaches may be used with permission of the director. Some courses on computational techniques, modeling, or statistics, such as visualization, graphics, and statistical and database packages may also be used to meet the requirements with prior approval of the director.

Total: 15 credits

Doctoral Degree

Computational Social Science, PhD

Banner Code: KR-PHD-CSS

The core objective of the computational social science (CSS) PhD program is to train graduate students to be professional computational social scientists in academia, government, or business. The program offers a unique and innovative interdisciplinary academic environment for systematically exploring, discovering, and developing skills to successfully follow careers in one of the areas of computational social science.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.

Admission Requirements

Applicants should have as background a bachelor’s degree in one of the social sciences; computer science, engineering, or a relevant discipline; and undergraduate courses in these and related areas. Bachelor’s degrees in the physical or biological sciences are also eligible, but applicants may be advised to take additional courses in social science or computer science as prerequisites to admission. Minimal requirements also include one undergraduate course in calculus and knowledge of a computer programming language, preferably object-based. Applicants should have an undergraduate degree from an accredited institution, with a GPA of at least 3.25. To apply, prospective students should send to the CSS Academic Programs Office a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, a current résumé, an expanded
goals statement not to exceed 2,000 words, and the names of two Mason faculty members who may be suitable advisors. Applicants should also include three letters of recommendation from faculty members or individuals with direct knowledge of the student’s academic or professional capabilities. The letters must arrive directly from the senders. Applicants should also submit an official report of scores obtained on the GRE-GEN. TOEFL scores are required for all international applicants.

CSS Academic Programs Office
Rm 382 Research Hall
4400 University Drive, MS 6B2
Fairfax, VA 22030

Students should also review the university-wide graduate admissions standards and procedures discussed in the Admission section of this catalog.

Degree Requirements

The program requires 72 credits beyond the baccalaureate degree, with a minimum of 48 credits in course work, and 24 credits of dissertation research. For those holding a master’s degree, the 72 required credits may be reduced by up to 30 credits, depending on graduate courses. A maximum of 24 credits of prior graduate course work may be transferred, provided such credits have not been used for another degree. The 48 credits of courses have the functional distribution and learning objectives indicated below.

12 credits of required core CSS courses:

- CSS 600 - Introduction to Computational Social Science Credits: 3
- CSS 605 - Object-Oriented Modeling in Social Science Credits: 3
- CSS 610 - Computational Analysis of Social Complexity Credits: 3
- CSS 620 - Origins of Social Complexity Credits: 3

6 credits of extended core CSS courses taken from the following:

- CSS 625 - Complexity Theory in the Social Sciences Credits: 3
- CSS 645 - Spatial Agent-Based Models of Human-Environment Interactions Credits: 3
- CSS 692 - Social Network Analysis Credits: 3

15 credits of discipline-based courses

15 credits of discipline-based social science courses in a specific area such as anthropology, economics, geography, history, linguistics, political science, or sociology, as approved by the student’s advisor, to provide domain-specific knowledge.

15 credits of elective courses

15 credits of elective courses or independent research, as approved by the student’s advisor, to provide further substantive or methodological specialization as needed. (Students with a strong background in computing, for example, a prior MS in computer science, but weaker social science training will be required to use all or most of these electives in a substantive social science. Conversely, students with a strong background in social science, for example, a BS in economics, will be required to use most or all of these electives in computing courses.)

24 credits of dissertation research
24 credits of dissertation research to demonstrate doctoral level originality and research excellence taken from:

- CSS 998 - Doctoral Dissertation Proposal Credits: 1-12
- CSS 999 - Doctoral Dissertation Credits: 1-12

Areas for dissertation research include, but are not limited to, the following:

- Agent-based computational economics: trade, finance, decision making under risk
- Computational political economy: voting, institutions, norms, inequality
- Computational linguistics: generative grammars, parsing, classifiers, inference
- Social network analysis: connectivity, structure, evolution of the Internet, cyber warfare
- Computational anthropology: emergence of hierarchy, settlement patterns
- Computational political science: systems of government, conflict and war, cooperation
- Computational sociology: segregation, collective action, leadership, trust
- Complexity theory: power laws, potential theory, criticality, bifurcation
- Computational methodology: multiagent systems, evolutionary computation

Total: 72 credits

Additional Information:

During the first year, each student will form a graduate studies committee, called the first-year committee, consisting of the student’s advisor plus two or three appropriately qualified individuals. The committee assists the student in designing a specific plan of study and evaluating the student’s progress by the end of the first year. During the second year, the student forms a doctoral committee, with membership approved by the CSS Program director. The committee will advise the student on preparing for the doctoral candidacy exams and preparing, developing, and defending the doctoral dissertation.

The candidacy exam is taken after students have completed all core requirements and a majority of additional course work (18 plus 15 credits), which typically corresponds to the fifth semester in the program. The purpose of the candidacy exam is to assess the student’s substantive and methodological knowledge in CSS as a whole and in the chosen focus area; the ability to integrate materials from different courses; and the potential for a successful dissertation.

The exam will consist of written and oral parts. Upon passing the candidacy exam and submitting an acceptable dissertation proposal, students are advanced to doctoral candidacy. The degree is awarded on the successful defense of a PhD dissertation that represents a detailed written report of an original and significant research contribution to the CSS field.

Molecular Neuroscience

Phone: 703-993-4333
Web: neuroscience.gmu.edu

The Krasnow Institute’s Department of Molecular Neuroscience, together with the College of Science (COS) and the College of Humanities and Social Sciences (CHSS), oversees the campus-wide Neuroscience Advisory Council in developing the Neuroscience PhD curriculum.

Neuroscience PhD courses are listed under NEUR in the Courses section of this catalog. Neuroscience PhD admissions and program requirements are listed under Neuroscience, PhD in the College of Science section of this catalog.
Dedicated to excellence in both teaching and research, the School of Management (SOM) educates future business leaders through world-class teaching, innovative academic programs and strategic business partnerships. With a curriculum rooted in entrepreneurship, corporate governance and global business education the school prepares undergraduate and graduate students for increased globalization through a range of academic programs and international alliances. SOM faculty are deeply engaged in the regional, national and international business communities and their academic expertise combined with real world experience provides a bridge in the classroom from academic theory to business practice.

Business leaders and organizations are actively involved with the School of Management through executive education programs, speaker engagements, classroom lectures, case competitions, internships, and career placement. SOM also maintains close connections to the business community through its advisory board and advisory councils to academic programs. More than 125 business leaders representing 75 different companies serve as advisory board or council members.

SOM enrolls more than 3,500 undergraduate students and more than 450 graduate students in its programs.

The School of Management’s programs offer students a variety of opportunities to enhance their professional endeavors.

- Our innovative curriculum meets the demands of the marketplace, focused on business fundamentals, strategic thinking and teamwork.
- Our highly respected distinguished faculty are cross-disciplinary collaborators and innovative practitioners that are passionate about education. They bring both theoretical and applied expertise to the classroom.
- Our outstanding career management professionals are dedicated to providing tailored support to promote our students’ professional advancement and leverage their degree over the short- and long-term.
- Our diverse student population offers unique opportunities to network and learn from your fellow classmates. Students at Mason represent over 130 different countries and all 50 states.

Administration

Jorge Haddock, Dean
Gerald Hanweck, Associate Dean, Graduate Programs
Roy Hinton, Associate Dean, Executive Programs
Alison O’Brien, Associate Dean, Undergraduate Programs
Pamela Allen, Assistant Dean, Academic and Career Services
Jaclyn Buchy, Assistant Dean, Graduate Enrollment
Rhett Wilson, Assistant Dean, Development
Jean-Pierre Auffret, Director, MS in Technology Management Program and MS in Management of Secure Information Systems Program
Anne Magro, Academic Director, Master of Science in Accounting Program
Robert Grosse, Director, Center for Global Business Innovation & Transformation
Faculty

Accounting


Finance

Anderson, Canterbury, Christophe, Crockett, Gao, Hanweck, Hsieh, Johnston, Philipov, Pilloff, Sanders, Wang, Xie

Information Systems and Operations Management

Beard, Bockstedt, Das, Druehl, Dutta, Mazumdar, Mehta, Menon, Mishra, Naor, Pang, Porter, Sanyal, Singer

Management


Marketing

Cheng, Harvey, Hoppner, Jaju, Joiner, Kulick, Li, McCrohan, Meamber, Mouri, Philpot, Rose-Robinson, Scott, Sussan

Courses and Programs

SOM offers all course work designated ACCT, BULE, EMBA, FNAN, GSOM, MBA, MGMT, MIS, MKTG, MSEC, MSOM, OM, REAL, SOM, and TECM in the Courses chapter of this catalog.

Undergraduate

The programs in management education culminate in a BS degree with a major from one of five areas: accounting, finance, information systems and operations management, management, or marketing.

Graduate

SOM offers an MBA, Executive MBA, MS in Accounting, MS in Real Estate Development, MS in Technology Management, and MS in Management of Secure Information Systems. Its Center for Real Estate Entrepreneurship focuses on real estate research and education in real estate development and finance.
Academic Policies

Students should become familiar with the university's general academic policies in addition to those specific to each academic unit. Please see the Academic Policies section of this catalog.

Appeals Process

The School of Management strives to maintain policies and procedures that are consistent with those of the University, as well as in the best interest of our students. If you have any questions concerning a particular policy or procedure, please contact the Office of Academic and Career Services, Room 008 of Enterprise Hall (703-993-1880).

Undergraduate Degree

Accounting, BS

Banner Code: BU-BS-ACCT

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

The BS in accounting (ACCT) prepares students for professional careers in the private and public sectors. The accounting major is designed to produce accounting professionals who can both generate and apply financial information to solve business problems. Our students learn principles of business and accounting as well as the specific skills and specialized technical knowledge necessary for success in the dynamic field of accounting. Our program emphasizes ethics, critical thinking, written and verbal communication, and effective use and understanding of technology. Our graduates are employed by the assurance, tax advisory, and consulting groups of the top accounting firms as well as Fortune 100 companies. Our proximity to the nations' capitol provides unique opportunities for our graduates to work in government and in the federal practices of public accounting firms. The accounting degree program is separately accredited by AACSB International.

Students interested in CPA certification can apply to the MSA degree to meet the 150 hour requirement for CPA certification in most states. The MSA offers a graduate degree in accounting that allows students to meet the 150 hour requirement for CPA certification in most states in only nine months.

Entering the School of Management

Application to the School of Management's (SOM) bachelor of science degree programs is in addition to the George Mason University’s admissions process. After acceptance to Mason, students who wish to pursue a major in accounting (ACCT), information systems and operations management (ISOM), finance (FNAN), management (MGMT), or marketing (MKTG) must submit a separate application to the School of Management. Students entering the School of Management are initially designated as "bachelor-pre" (BPRE) until successfully completing the SOM application requirements and obtaining bachelor of science (BS) degree status.

Acceptance to the SOM bachelor of science program is competitive based on applicants’ cumulative GPAs from all institutions attended. Students may apply for acceptance into the School of Management a maximum of two times.

SOM Application Requirements
Students are responsible for the application requirements in effect at the time of application to SOM and should check som.gmu.edu/ for changes to the requirements. The following requirements are for the academic year 2012-13:

1. Successfully complete at least 48 credits with at least 9 credits earned at Mason prior to the semester of admission.
2. Applicants must successfully complete all courses taken in the semester of application with a grade of "C" or higher.
3. Successful completion of the following courses with a grade of C or better:
   • ACCT 203 - Survey of Accounting Credits: 3
   • OM 210 - Statistical Analysis for Management Credits: 4
   • SOM 301 - Business Models: A Communication Approach Credits: 3
   • MATH 108 - Introductory Calculus with Business Applications Credits: 3
   OR
   • MATH 113 - Analytic Geometry and Calculus I Credits: 4

Deadlines for Application to BS Degree Status

Students should submit their formal application to the School of Management before the deadline of the semester they are completing the requirements listed above. The deadlines are:

- November 1 for acceptance the following spring semester;
- July 1 for acceptance the following fall semester.

For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

Academic Advising

Academic planning for undergraduate students is available in the SOM Office of Academic and Career Services, Enterprise Hall, Room 008. Students are encouraged to consult with an advisor regularly. Any student who wishes to change to a major in SOM must consult a SOM academic advisor for degree requirements. For more information about walk-in advising hours or scheduling an appointment, call 703-993-1880, or go to som.gmu.edu.

BU-BS Degree Requirements

SOM students pursuing a BS degree must complete a minimum of 120 credits, including the University General Education requirements, SOM general education, SOM core courses, and major requirements. In addition, the following requirements must be met:

- A minimum of 45 credits at the 300- or 400-level.
- A minimum of 30 credits of SOM core and major courses at Mason.
- At least 9 credits required for the specific major and SOM 498 taken at Mason.
- A grade of C or higher earned in the SOM core and major requirements.

Students should carefully examine prerequisites for SOM courses. Students may be removed from a course if they enroll without having fulfilled the prerequisites.

General Education Requirements (31-32 credits)

SOM students must complete the University General Education requirements, plus 1 additional credit of natural science (the SOM natural science requirement must be fulfilled by completing two 4-credit laboratory sciences).
SOM General Education (15-16 credits)

- ECON 103 - Contemporary Microeconomic Principles Credits: 3 with a grade of C or higher
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3 with a grade of C or higher
  (ECON 103 or 104 satisfies the University General Education social and behavioral science requirement)
- 3 credits of Upper-Level (300-400) ECON (Excludes ECON 385)
- MATH 108 - Introductory Calculus with Business Applications Credits: 3 with a grade of C or higher
  OR
- MATH 113 - Analytic Geometry and Calculus I Credits: 4 with a grade of C or higher
  (MATH 108 or MATH 113 satisfies the University General Education quantitative reasoning requirement)
- 3 credits of ANTH, PSYC, SOCI or SOM 100

SOM Core Courses (35 Credits)

A grade of C or higher is required in each of the School of Management core courses listed below. Students will not be permitted to make more than three attempts to achieve a C or higher in the following School of Management core courses: ACCT 301, BULE 302, FNAN 301, MGMT 301, MIS 301, MKTG 301, OM 301 and SOM 301. Those who do not successfully complete these core courses within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

- ACCT 203 - Survey of Accounting Credits: 3
- ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
- FNAN 301 - Financial Management Credits: 3
- MGMT 301 - People and Organizations Credits: 3
- MIS 102 - Spreadsheet Applications for Business Credits: 1
- MIS 301 - Introduction to Business Information Systems Credits: 3
- MKTG 301 - Principles of Marketing Credits: 3
- OM 210 - Statistical Analysis for Management Credits: 4
- OM 301 - Operations Management Credits: 3
- SOM 301 - Business Models: A Communication Approach Credits: 3 (Satisfies the University General Education writing intensive requirement.)
- SOM 498 - Capstone Course: Advanced Business Models Credits: 3 (Satisfies the University General Education synthesis requirement.)

General Electives (20 credits)

General electives may be selected from any University or SOM course, except courses designated for the Business minor (MSOM).

Major Requirements in Accounting

Required Courses (18 Credits)
Note: Completion of ACCT 301 with a grade of B- or higher is required for ACCT 311, 331 and 361.

- ACCT 311 - Managerial and Cost Accounting Credits: 3
- ACCT 331 - Intermediate Financial Accounting I Credits: 3
- ACCT 332 - Intermediate Financial Accounting II Credits: 3
- ACCT 351 - Taxation and Managerial Decision Making Credits: 3
- ACCT 361 - Accounting Information Systems Credits: 3
- ACCT 461 - Assurance and Audit Services Credits: 3

Electives

The following courses are available if students wish to take more than the 18 required accounting credits. Materials are available in the Office of Academic and Career Services to provide guidance regarding recommended electives. Students who anticipate taking the CPA, CMA, CIA, or other professional exam should consult the applicable regulations and meet with their advisor. State regulations regarding professional examinations may dictate course selections.

- ACCT 372 - Business Analysis and Valuation Credits: 3
- ACCT 411 - Advanced Managerial Accounting Credits: 3
- ACCT 433 - Advanced Financial Accounting Credits: 3
- ACCT 451 - Advanced Federal Taxation Credits: 3
- ACCT 462 - Honors Seminar in Accounting Credits: 3
- ACCT 472 - Government and Not-for-Profit Accounting Credits: 3
- ACCT 491 - Seminar in Accounting Credits: 3
- ACCT 499 - Independent Study Credits: 1-3
- BULE 402 - Commercial Law Credits: 3

Honors in Accounting

Accounting majors with an A or better in ACCT 301 and an overall GPA of 3.00 are eligible for the Accounting Honors Program. To graduate with honors in accounting, a student must actively participate in the accounting honor program events, receive a B or better in ACCT 462, maintain a minimum overall GPA of 3.00, and maintain a minimum GPA of 3.50 in all accounting courses above ACCT 301, earning no grade below a B-.

Total: 120 credits

Finance, BS

Banner Code: BU-BS-FNAN

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

The BS in finance (FNAN) prepares students for professional careers by providing a solid foundation in the financial principles necessary to make operating decisions for an organization and in financial market analysis.
Entering the School of Management

Application to the School of Management's (SOM) bachelor of science degree programs is in addition to the George Mason University’s admissions process. After acceptance to Mason, students who wish to pursue a major in accounting (ACCT), information systems and operations management (ISOM), finance (FNAN), management (MGMT), or marketing (MKTG) must submit a separate application to the School of Management. Students entering the School of Management are initially designated as "bachelor-pre" (BPRE) until successfully completing the SOM application requirements and obtaining bachelor of science (BS) degree status.

Acceptance to the SOM bachelor of science program is competitive based on applicants’ cumulative GPAs from all institutions attended. Students may apply for acceptance into the School of Management a maximum of two times.

SOM Application Requirements

Students are responsible for the application requirements in effect at the time of application to SOM and should check som.gmu.edu/ for changes to the requirements. The following requirements are for the academic year 2012-13:

1. Successfully complete at least 48 credits with at least 9 credits earned at Mason prior to the semester of admission.
2. Applicants must successfully complete all courses taken in the semester of application with a grade of "C" or higher.
3. Successful completion of the following courses with a grade of C or better:
   - ACCT 203 - Survey of Accounting Credits: 3
   - OM 210 - Statistical Analysis for Management Credits: 4
   - SOM 301 - Business Models: A Communication Approach Credits: 3
   - MATH 108 - Introductory Calculus with Business Applications Credits: 3
   OR
   - MATH 113 - Analytic Geometry and Calculus I Credits: 4

Deadlines for Application to BS Degree Status

Students should submit their formal application to the School of Management before the deadline of the semester they are completing the requirements listed above. The deadlines are:

- November 1 for acceptance the following spring semester;
- July 1 for acceptance the following fall semester.

For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

Academic Advising

Academic planning for undergraduate students is available in the SOM Office of Academic and Career Services, Enterprise Hall, Room 008. Students are encouraged to consult with an advisor regularly. Any student who wishes to change to a major in SOM must consult a SOM academic advisor for degree requirements. For more information about walk-in advising hours or scheduling an appointment, call 703-993-1880, or go to som.gmu.edu.

BU-BS Degree Requirements

SOM students pursuing a BS degree must complete a minimum of 120 credits, including the University General Education requirements, SOM general education, SOM core courses, and major requirements. In addition, the following requirements must
be met:

- A minimum of 45 credits at the 300- or 400-level.
- A minimum of 30 credits of SOM core and major courses at Mason.
- At least 9 credits required for the specific major and SOM 498 taken at Mason.
- A grade of C or higher earned in the SOM core and major requirements.

Students should carefully examine prerequisites for SOM courses. Students may be removed from a course if they enroll without having fulfilled the prerequisites.

General Education Requirements (31-32 credits)

SOM students must complete the University General Education requirements, plus 1 additional credit of natural science (the SOM natural science requirement must be fulfilled by completing two 4-credit laboratory sciences).

SOM General Education (15-16 credits)

- ECON 103 - Contemporary Microeconomic Principles Credits: 3 with a grade of C or higher
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3 with a grade of C or higher
  (ECON 103 or 104 satisfies the University General Education social and behavioral science requirement)
- 3 credits of Upper-Level (300-400) ECON (Excludes ECON 385)
- MATH 108 - Introductory Calculus with Business Applications Credits: 3 with a grade of C or higher
  OR
- MATH 113 - Analytic Geometry and Calculus I Credits: 4 with a grade of C or higher
  (MATH 108 or MATH 113 satisfies the University General Education quantitative reasoning requirement)
- 3 credits of ANTH, PSYC, SOCI or SOM 100

SOM Core Courses (35 Credits)

A grade of C or higher is required in each of the School of Management core courses listed below. Students will not be permitted to make more than three attempts to achieve a C or higher in the following School of Management core courses: ACCT 301, BULE 302, FNAN 301, MGMT 301, MIS 301, MKTG 301, OM 301 and SOM 301. Those who do not successfully complete these core courses within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

- ACCT 203 - Survey of Accounting Credits: 3
- ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
- FNAN 301 - Financial Management Credits: 3
- MGMT 301 - People and Organizations Credits: 3
- MIS 102 - Spreadsheet Applications for Business Credits: 1
- MIS 301 - Introduction to Business Information Systems Credits: 3
- MKTG 301 - Principles of Marketing Credits: 3
- OM 210 - Statistical Analysis for Management Credits: 4
- OM 301 - Operations Management Credits: 3
• SOM 301 - Business Models: A Communication Approach Credits: 3 (Satisfies the University General Education writing intensive requirement.)
• SOM 498 - Capstone Course: Advanced Business Models Credits: 3 (Satisfies the University General Education synthesis requirement.)

General Electives (20 credits)

General electives may be selected from any University or SOM course, except courses designated for the Business minor (MSOM).

Major Requirements in Finance (18 Credits)

Required Courses (choose three):

• FNAN 302 - Financial Analysis, Forecasting, and Valuation Credits: 3
• FNAN 311 - Principles of Investment Credits: 3
• FNAN 321 - Financial Institutions Credits: 3
• FNAN 401 - Advanced Financial Management Credits: 3

Electives (choose three):

Students may select any 300-400 level FNAN courses (except FNAN 301) to fulfill the elective requirement, including, but not limited to, courses from the following list:

• FNAN 302 - Financial Analysis, Forecasting, and Valuation Credits: 3 (If not taken as a required course.)
• FNAN 311 - Principles of Investment Credits: 3 (If not taken as a required course.)
• FNAN 321 - Financial Institutions Credits: 3 (If not taken as a required course.)
• FNAN 351 - Principles of Real Estate Credits: 3
• FNAN 401 - Advanced Financial Management Credits: 3 (If not taken as a required course.)
• FNAN 411 - Investment Analysis and Portfolio Management Credits: 3
• FNAN 412 - Futures and Options Markets Credits: 3
• FNAN 421 - Money and Capital Markets Credits: 3
• FNAN 430 - Empirical Methods in Finance Credits: 3
• FNAN 432 - Fixed-Income Securities Credits: 3
• FNAN 440 - International Financial Management Credits: 3
• FNAN 451 - Real Estate Finance Credits: 3
• FNAN 454 - Real Estate Development Credits: 3
• FNAN 462 - Honors Seminar in Finance Credits: 3
• FNAN 491 - Special Topics in Finance Credits: 3
• FNAN 499 - Independent Study Credits: 1-3
Total: 120 credits

Information Systems and Operations Management, BS

Banner Code: BU-BS-ISOM

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

The BS in information systems and operations management (ISOM) prepares students for a range of career options by instilling skills that add value to organizations. Graduates will apply their knowledge of technology and business functions to design and improve existing operational and core business processes. They will integrate different business functions into seamless IT-enabled processes and collaborate with business users in defining requirements, identifying new IT-driven business opportunities, building prototypes to validate operations, and managing complex technology projects. The content of the ISOM major is at the intersection of technology, processes, and people.

Entering the School of Management

Application to the School of Management's (SOM) bachelor of science degree programs is in addition to the George Mason University’s admissions process. After acceptance to Mason, students who wish to pursue a major in accounting (ACCT), information systems and operations management (ISOM), finance (FNAN), management (MGMT), or marketing (MKTG) must submit a separate application to the School of Management. Students entering the School of Management are initially designated as "bachelor-pre" (BPRE) until successfully completing the SOM application requirements and obtaining bachelor of science (BS) degree status.

Acceptance to the SOM bachelor of science program is competitive based on applicants’ cumulative GPAs from all institutions attended. Students may apply for acceptance into the School of Management a maximum of two times.

SOM Application Requirements

Students are responsible for the application requirements in effect at the time of application to SOM and should check som.gmu.edu/ for changes to the requirements. The following requirements are for the academic year 2012-13:

1. Successfully complete at least 48 credits with at least 9 credits earned at Mason prior to the semester of admission.
2. Applicants must successfully complete all courses taken in the semester of application with a grade of "C" or higher.
3. Successful completion of the following courses with a grade of C or better:
   - ACCT 203 - Survey of Accounting Credits: 3
   - OM 210 - Statistical Analysis for Management Credits: 4
   - SOM 301 - Business Models: A Communication Approach Credits: 3
   - MATH 108 - Introductory Calculus with Business Applications Credits: 3
     OR
   - MATH 113 - Analytic Geometry and Calculus I Credits: 4
Deadlines for Application to BS Degree Status

Students should submit their formal application to the School of Management before the deadline of the semester they are completing the requirements listed above. The deadlines are:

- November 1 for acceptance the following spring semester;
- July 1 for acceptance the following fall semester.

For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

Academic Advising

Academic planning for undergraduate students is available in the SOM Office of Academic and Career Services, Enterprise Hall, Room 008. Students are encouraged to consult with an advisor regularly. Any student who wishes to change to a major in SOM must consult a SOM academic advisor for degree requirements. For more information about walk-in advising hours or scheduling an appointment, call 703-993-1880, or go to som.gmu.edu.

BU-BS Degree Requirements

SOM students pursuing a BS degree must complete a minimum of 120 credits, including the University General Education requirements, SOM general education, SOM core courses, and major requirements. In addition, the following requirements must be met:

- A minimum of 45 credits at the 300- or 400-level.
- A minimum of 30 credits of SOM core and major courses at Mason.
- At least 9 credits required for the specific major and SOM 498 taken at Mason.
- A grade of C or higher earned in the SOM core and major requirements.

Students should carefully examine prerequisites for SOM courses. Students may be removed from a course if they enroll without having fulfilled the prerequisites.

General Education Requirements (31-32 credits)

SOM students must complete the University General Education requirements, plus 1 additional credit of natural science (the SOM natural science requirement must be fulfilled by completing two 4-credit laboratory sciences).

SOM General Education (15-16 credits)

- ECON 103 - Contemporary Microeconomic Principles Credits: 3 with a grade of C or higher
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3 with a grade of C or higher
  (ECON 103 or 104 satisfies the University General Education social and behavioral science requirement)
- 3 credits of Upper-Level (300-400) ECON (Excludes ECON 385)
- MATH 108 - Introductory Calculus with Business Applications Credits: 3 with a grade of C or higher
  OR
- MATH 113 - Analytic Geometry and Calculus I Credits: 4 with a grade of C or higher
  (MATH 108 or MATH 113 satisfies the University General Education quantitative reasoning requirement)
- 3 credits of ANTH, PSYC, SOCI or SOM 100
SOM Core Courses (35 Credits)

A grade of C or higher is required in each of the School of Management core courses listed below. Students will not be permitted to make more than three attempts to achieve a C or higher in the following School of Management core courses: ACCT 301, BULE 302, FNAN 301, MGMT 301, MKTG 301, OM 301 and SOM 301. Those who do not successfully complete these core courses within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

- ACCT 203 - Survey of Accounting Credits: 3
- ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
- FNAN 301 - Financial Management Credits: 3
- MGMT 301 - People and Organizations Credits: 3
- MIS 102 - Spreadsheet Applications for Business Credits: 1
- MIS 301 - Introduction to Business Information Systems Credits: 3
- MKTG 301 - Principles of Marketing Credits: 3
- OM 210 - Statistical Analysis for Management Credits: 4
- OM 301 - Operations Management Credits: 3
- SOM 301 - Business Models: A Communication Approach Credits: 3 (Satisfies the University General Education writing intensive requirement.)
- SOM 498 - Capstone Course: Advanced Business Models Credits: 3 (Satisfies the University General Education synthesis requirement.)

General Electives (20 credits)

General electives may be selected from any University or SOM course, except courses designated for the Business minor (MSOM).

Major Requirements in Information Systems and Operations Management (18 Credits)

Required Courses:

- MIS 310 - Database Management Systems Credits: 3
- MIS 330 - Systems Analysis and Design Credits: 3
- OM 493 - Management of Technology Projects Credits: 3

Electives (choose three):

Students have considerable flexibility in their choice of electives and may choose from two tracks of study: one in management information systems, which prepares students for a career in the IT industry; and the other in management of business operations,
which develops expertise in areas such as quality, project, and supply chain management and business process analysis. Students are strongly urged to discuss their choice of electives and programs of study with their academic advisor. It is also strongly recommended that students planning to major in ISOM take MIS 302 as part of their program.

Students may select any 300-400 level MIS or OM courses (except MIS 301 and OM 301) to fulfill the elective requirement, including, but not limited to, courses from the following list:

- OM 320 - Supply Chain Management and E-Business Credits: 3
- OM 352 - Methods and Models of Management Science Credits: 3
- OM 435 - Business Process Analysis and Simulation Credits: 3
- OM 452 - Business Forecasting Credits: 3
- OM 456 - Quality Management Credits: 3
- OM 462 - Honors Seminar in Operations Management Credits: 3
- OM 499 - Independent Study in Operations Management Credits: 1-3
- MIS 302 - Introduction to Programming for Business Applications Credits: 3
- MIS 320 - Networks and Security Credits: 3
- MIS 411 - Management and Control of Information Systems Credits: 3
- MIS 412 - E-Business Systems Development Credits: 3
- MIS 430 - Data Warehousing and Data Mining Credits: 3
- MIS 435 - Knowledge Management Credits: 3
- MIS 440 - E-Commerce Business Models and Applications Credits: 3
- MIS 462 - Honors Seminar in Management Information Systems Credits: 3
- MIS 491 - Seminar in Management Information Systems Credits: 3
- MIS 499 - Independent Study in Management Information Systems Credits: 1-3

Total hours: 120

Management, BS

Banner Code: BU-BS-MGMT

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

The BS in management prepares students to take leadership, management, and entrepreneurial roles in the public and private sectors. Students learn such skills as strategic thinking, motivating and managing nationally and internationally diverse workforces, building and leading team efforts, negotiating successfully, and instituting planned change in organizations.

Entering the School of Management

Application to the School of Management's (SOM) bachelor of science degree programs is in addition to the George Mason University’s admissions process. After acceptance to Mason, students who wish to pursue a major in accounting (ACCT), information systems and operations management (ISOM), finance (FNAN), management (MGMT), or marketing (MKTG) must submit a separate application to the School of Management. Students entering the School of Management are initially designated as "bachelor-pre" (BPRE) until successfully completing the SOM application requirements and obtaining bachelor of science (BS) degree status.
Acceptance to the SOM bachelor of science program is competitive based on applicants’ cumulative GPAs from all institutions attended. Students may apply for acceptance into the School of Management a maximum of two times.

**SOM Application Requirements**

Students are responsible for the application requirements in effect at the time of application to SOM and should check som.gmu.edu for changes to the requirements. The following requirements are for the academic year 2012-13:

1. Successfully complete at least 48 credits with at least 9 credits earned at Mason prior to the semester of admission.
2. Applicants must successfully complete all courses taken in the semester of application with a grade of "C" or higher.
3. Successful completion of the following courses with a grade of C or better:
   - ACCT 203 - Survey of Accounting Credits: 3
   - OM 210 - Statistical Analysis for Management Credits: 4
   - SOM 301 - Business Models: A Communication Approach Credits: 3
   - MATH 108 - Introductory Calculus with Business Applications Credits: 3
   OR
   - MATH 113 - Analytic Geometry and Calculus I Credits: 4

**Deadlines for Application to BS Degree Status**

Students should submit their formal application to the School of Management before the deadline of the semester they are completing the requirements listed above. The deadlines are:

- November 1 for acceptance the following spring semester;
- July 1 for acceptance the following fall semester.

For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

**Academic Advising**

Academic planning for undergraduate students is available in the SOM Office of Academic and Career Services, Enterprise Hall, Room 008. Students are encouraged to consult with an advisor regularly. Any student who wishes to change to a major in SOM must consult a SOM academic advisor for degree requirements. For more information about walk-in advising hours or scheduling an appointment, call 703-993-1880, or go to som.gmu.edu.

**BU-BS Degree Requirements**

SOM students pursuing a BS degree must complete a minimum of 120 credits, including the University General Education requirements, SOM general education, SOM core courses, and major requirements. In addition, the following requirements must be met:

- A minimum of 45 credits at the 300- or 400-level.
- A minimum of 30 credits of SOM core and major courses at Mason.
- At least 9 credits required for the specific major and SOM 498 taken at Mason.
- A grade of C or higher earned in the SOM core and major requirements.

Students should carefully examine prerequisites for SOM courses. Students may be removed from a course if they enroll without having fulfilled the prerequisites.
General Education Requirements (31-32 credits)

SOM students must complete the University General Education requirements, plus 1 additional credit of natural science (the SOM natural science requirement must be fulfilled by completing two 4-credit laboratory sciences).

SOM General Education (15-16 credits)

- ECON 103 - Contemporary Microeconomic Principles Credits: 3 with a grade of C or higher
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3 with a grade of C or higher
  (ECON 103 or 104 satisfies the University General Education social and behavioral science requirement)
- 3 credits of Upper-Level (300-400) ECON (Excludes ECON 385)
- MATH 108 - Introductory Calculus with Business Applications Credits: 3 with a grade of C or higher
  OR
- MATH 113 - Analytic Geometry and Calculus I Credits: 4 with a grade of C or higher
  (MATH 108 or MATH 113 satisfies the University General Education quantitative reasoning requirement)
- 3 credits of ANTH, PSYC, SOCI or SOM 100

SOM Core Courses (35 Credits)

A grade of C or higher is required in each of the School of Management core courses listed below. Students will not be permitted to make more than three attempts to achieve a C or higher in the following School of Management core courses: ACCT 301, BULE 302, FNAN 301, MGMT 301, MIS 301, MKTG 301, OM 301 and SOM 301. Those who do not successfully complete these core courses within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

- ACCT 203 - Survey of Accounting Credits: 3
- ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
- FNAN 301 - Financial Management Credits: 3
- MGMT 301 - People and Organizations Credits: 3
- MIS 102 - Spreadsheet Applications for Business Credits: 1
- MIS 301 - Introduction to Business Information Systems Credits: 3
- MKTG 301 - Principles of Marketing Credits: 3
- OM 210 - Statistical Analysis for Management Credits: 4
- OM 301 - Operations Management Credits: 3
- SOM 301 - Business Models: A Communication Approach Credits: 3 (Satisfies the University General Education writing intensive requirement.)
- SOM 498 - Capstone Course: Advanced Business Models Credits: 3 (Satisfies the University General Education synthesis requirement.)

General Electives (20 credits)

General electives may be selected from any University or SOM course, except courses designated for the Business minor (MSOM).
Major Requirements in Management (18 Credits)

Required Courses:

- MGMT 312 - Principles and Practices of Management Credits: 3
- MGMT 321 - Introduction to Human Resource Management Credits: 3

Electives (choose four):

Students may select any 300-400 level MGMT courses (except MGMT 301) to fulfill the elective requirement, including, but not limited to, courses from the following list:

- MGMT 412 - Diversity in Organizations Credits: 3
- MGMT 413 - Organizational Development and Management Consulting Credits: 3
- MGMT 421 - Advanced Human Resource Management Credits: 3
- MGMT 431 - The Legal Environment for Employee and Labor Relations Credits: 3
- MGMT 451 - New Venture Creation Credits: 3
- MGMT 461 - Cross Cultural and Global Management Credits: 3
- MGMT 462 - Honors Seminar in Management Credits: 3
- MGMT 463 - Negotiations in Organizations Credits: 3
- MGMT 464 - Teamwork and Interpersonal Skills Credits: 3
- MGMT 471 - Competitive Strategy Credits: 3
- MGMT 491 - Current Topics in Management Credits: 3
- MGMT 499 - Independent Study Credits: 1-3
- BULE 402 - Commercial Law Credits: 3

Notes:

Management majors may focus their careers in several areas. In selecting four elective courses, students may want to consider a likely career path. Recommended courses for three possible careers are provided below.

Human Resource Management

- MGMT 421 - Advanced Human Resource Management Credits: 3
- MGMT 431 - The Legal Environment for Employee and Labor Relations Credits: 3

Front-Line Manager or Management Trainee

- MGMT 412 - Diversity in Organizations Credits: 3
- MGMT 463 - Negotiations in Organizations Credits: 3
- MGMT 464 - Teamwork and Interpersonal Skills Credits: 3
Entrepreneur

- MGMT 451 - New Venture Creation Credits: 3
- MGMT 471 - Competitive Strategy Credits: 3
- BULE 402 - Commercial Law Credits: 3

Honors Seminar:

Students with a GPA of at least 3.00 are offered the opportunity to further distinguish their record by participating in MGMT 462 - Honors Seminar in Management, which addresses a key contemporary management issue in an intensive small group format.

To be eligible for enrollment in MGMT 462, students must be accepted into SOM with a management major, have a cumulative GPA of at least 3.00 with a minimum of 75 semester hours of course work, have a minimum GPA of 3.00 in course work completed for the management major, and be recommended by faculty. The class size of the Honors Seminar will be kept small. If the number of interested and qualified students exceeds the number of available spots, management area faculty will select the most qualified students to participate.

Total hours: 120

Marketing, BS

Banner Code: BU-BS-MKTG

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

The BS in marketing prepares students for a broad range of global and domestic career options in market and consumer research, brand management, advertising, customer relationship management, new market and business development, and marketing strategy. Marketing opportunities are increasing in the new economy as firms, government agencies, and nonprofit organizations adopt a market orientation.

A marketing major provides students with a solid background in marketing concepts and practices, with emphasis on market analysis and planning, research, and consumer behavior. Because marketing draws on a variety of disciplines for its foundation and is practiced globally, marketing majors are encouraged to take electives in related fields such as psychology, sociology, economics, public policy, international studies, computer science, and foreign languages.

Entering the School of Management

Application to the School of Management's (SOM) bachelor of science degree programs is in addition to the George Mason University’s admissions process. After acceptance to Mason, students who wish to pursue a major in accounting (ACCT), information systems and operations management (ISOM), finance (FNAN), management (MGMT), or marketing (MKTG) must submit a separate application to the School of Management. Students entering the School of Management are initially designated as "bachelor-pre" (BPRE) until successfully completing the SOM application requirements and obtaining bachelor of science (BS) degree status.
Acceptance to the SOM bachelor of science program is competitive based on applicants’ cumulative GPAs from all institutions attended. Students may apply for acceptance into the School of Management a maximum of two times.

**SOM Application Requirements**

Students are responsible for the application requirements in effect at the time of application to SOM and should check som.gmu.edu/ for changes to the requirements. The following requirements are for the academic year 2012-13:

1. Successfully complete at least 48 credits with at least 9 credits earned at Mason prior to the semester of admission.
2. Applicants must successfully complete all courses taken in the semester of application with a grade of "C" or higher.
3. Successful completion of the following courses with a grade of C or better:
   - ACCT 203 - Survey of Accounting Credits: 3
   - OM 210 - Statistical Analysis for Management Credits: 4
   - SOM 301 - Business Models: A Communication Approach Credits: 3
   - MATH 108 - Introductory Calculus with Business Applications Credits: 3
   - OR
   - MATH 113 - Analytic Geometry and Calculus I Credits: 4

**Deadlines for Application to BS Degree Status**

Students should submit their formal application to the School of Management before the deadline of the semester they are completing the requirements listed above. The deadlines are:

- November 1 for acceptance the following spring semester;
- July 1 for acceptance the following fall semester.

For more information about the application process, contact the Office of Academic and Career Services, 703-993-1880, or visit som.gmu.edu.

**Academic Advising**

Academic planning for undergraduate students is available in the SOM Office of Academic and Career Services, Enterprise Hall, Room 008. Students are encouraged to consult with an advisor regularly. Any student who wishes to change to a major in SOM must consult a SOM academic advisor for degree requirements. For more information about walk-in advising hours or scheduling an appointment, call 703-993-1880, or go to som.gmu.edu.

**BU-BS Degree Requirements**

SOM students pursuing a BS degree must complete a minimum of 120 credits, including the University General Education requirements, SOM general education, SOM core courses, and major requirements. In addition, the following requirements must be met:

- A minimum of 45 credits at the 300- or 400-level.
- A minimum of 30 credits of SOM core and major courses at Mason.
- At least 9 credits required for the specific major and SOM 498 taken at Mason.
- A grade of C or higher earned in the SOM core and major requirements.

Students should carefully examine prerequisites for SOM courses. Students may be removed from a course if they enroll without having fulfilled the prerequisites.
General Education Requirements (31-32 credits)

SOM students must complete the University General Education requirements, plus 1 additional credit of natural science (the SOM natural science requirement must be fulfilled by completing two 4-credit laboratory sciences).

SOM General Education (15-16 credits)

- ECON 103 - Contemporary Microeconomic Principles Credits: 3 with a grade of C or higher
- ECON 104 - Contemporary Macroeconomic Principles Credits: 3 with a grade of C or higher
  (ECON 103 or 104 satisfies the University General Education social and behavioral science requirement)
- 3 credits of Upper-Level (300-400) ECON (Excludes ECON 385)
- MATH 108 - Introductory Calculus with Business Applications Credits: 3 with a grade of C or higher
  OR
- MATH 113 - Analytic Geometry and Calculus I Credits: 4 with a grade of C or higher
  (MATH 108 or MATH 113 satisfies the University General Education quantitative reasoning requirement)
- 3 credits of ANTH, PSYC, SOCI or SOM 100

SOM Core Courses (35 Credits)

A grade of C or higher is required in each of the School of Management core courses listed below. Students will not be permitted to make more than three attempts to achieve a C or higher in the following School of Management core courses: ACCT 301, BULE 302, FNAN 301, MGMT 301, MIS 301, MKTG 301, OM 301 and SOM 301. Those who do not successfully complete these core courses within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

- ACCT 203 - Survey of Accounting Credits: 3
- ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
- FNAN 301 - Financial Management Credits: 3
- MGMT 301 - People and Organizations Credits: 3
- MIS 102 - Spreadsheet Applications for Business Credits: 1
- MIS 301 - Introduction to Business Information Systems Credits: 3
- MKTG 301 - Principles of Marketing Credits: 3
- OM 210 - Statistical Analysis for Management Credits: 4
- OM 301 - Operations Management Credits: 3
- SOM 301 - Business Models: A Communication Approach Credits: 3 (Satisfies the University General Education writing intensive requirement.)
- SOM 498 - Capstone Course: Advanced Business Models Credits: 3 (Satisfies the University General Education synthesis requirement.)

General Electives (20 credits)

General electives may be selected from any University or SOM course, except courses designated for the Business minor (MSOM).
Major Requirements in Marketing (18 Credits)

Required Courses:

• MKTG 312 - Consumer Behavior Credits: 3
• MKTG 351 - Marketing Research Techniques and Applications Credits: 3
• MKTG 471 - Marketing Management Credits: 3

Electives (choose three):

Students may select any 300-400 level MKTG courses (except MKTG 301) to fulfill the elective requirement, including, but not limited to, courses from the following list:

• MKTG 311 - Sales Management Credits: 3
• MKTG 313 - Integrated Marketing Communications Credits: 3
• MKTG 315 - Internet Marketing Credits: 3
• MKTG 332 - Retailing and E-Commerce Management Credits: 3
• MKTG 333 - Business to Business Marketing Credits: 3
• MKTG 407 - International Marketing Credits: 3
• MKTG 451 - Competitive Intelligence and Information Security Credits: 3
• MKTG 455 - Ethnic and Multicultural Marketing Credits: 3
• MKTG 462 - Honors Seminar in Marketing Credits: 3
• MKTG 481 - Marketing in the Nonprofit Sector Credits: 3
• MKTG 491 - Special Topics in Marketing Credits: 3
• MKTG 499 - Independent Study Credits: 1-3

Notes:

Marketing also offers a specialization in Internet Marketing Resiliency (IMR) within the marketing major. This specialization prepares students to enhance and protect the electronic marketing efforts of their firms. In selecting four courses for the IMR specialization, students should consider those provided below.

Required Course for IMR

For the IMR specialization, students must complete:

• MKTG 451 - Competitive Intelligence and Information Security Credits: 3

Courses for IMR

• MIS 320 - Networks and Security Credits: 3
Bachelor's Level Certificate

Accounting Undergraduate Certificate

Banner Code: BU-CERB-ACCT

Associate Dean for Undergraduate Programs
Phone: 703-993-1880
Web: som.gmu.edu

This program provides an opportunity for nondegree-seeking students to earn the academic credit necessary to sit for the Uniform CPA Examination in Virginia. The requirement for enrollment is a bachelor’s degree or higher from an accredited college or university.

Students are required to complete a minimum of 30 credits of accounting courses. More than half of the required credits must be taken at GMU after acceptance to the certificate program. Students have four years to complete certificate requirements. Students who are given permission to re-enroll following an absence from Mason may not count the four-year time limit as beginning on the date of re-enrollment. Successful completion of the certificate program requires a grade of C or better in accounting courses and a GPA of at least 2.00 in all courses. All students who wish to sit for the Uniform CPA Examination in Virginia are required to have completed 150 college-level credits, including at least 30 credits of accounting with courses in financial accounting, auditing, taxation, and management accounting; and at least 24 credits of non-accounting business courses. To receive the Mason accounting certificate, individuals must have completed the following required accounting courses or their equivalents. A grade of B- or higher must be earned in ACCT 301 in order to move on to ACCT 311, 331, and 361.

The Accounting Undergraduate Certificate may be pursued on a part-time basis. Maintaining full-time status is not guaranteed.

Certificate Requirements

Required Courses (24 credits):

- ACCT 203 - Survey of Accounting Credits: 3
- ACCT 301 - Financial Accounting and Managerial Decision Making Credits: 3
- ACCT 311 - Managerial and Cost Accounting Credits: 3
- ACCT 331 - Intermediate Financial Accounting I Credits: 3
- ACCT 332 - Intermediate Financial Accounting II Credits: 3
Electives (6 credits):

- ACCT 372 - Business Analysis and Valuation Credits: 3
- ACCT 411 - Advanced Managerial Accounting Credits: 3
- ACCT 433 - Advanced Financial Accounting Credits: 3
- ACCT 451 - Advanced Federal Taxation Credits: 3
- ACCT 462 - Honors Seminar in Accounting Credits: 3
- ACCT 472 - Government and Not-for-Profit Accounting Credits: 3
- ACCT 491 - Seminar in Accounting Credits: 3
- ACCT 499 - Independent Study Credits: 1-3

Note:

If a student has a previous degree in business or accounting, the faculty recommends that students take SOM courses above the 301 level to complete the 16 Mason credits needed after acceptance to the certificate program.

If a student has not previously studied business, the following courses are recommended:

- BULE 302 - Legal Environment of Business Credits: 3
- BULE 402 - Commercial Law Credits: 3
- FNAN 301 - Financial Management Credits: 3
- FNAN 302 - Financial Analysis, Forecasting, and Valuation Credits: 3
- MIS 301 - Introduction to Business Information Systems Credits: 3
- OM 210 - Statistical Analysis for Management Credits: 4

Total credits: 30

Undergraduate Minor

Business Minor

Banner Code: BUS

The business minor provides an introduction to the skills needed for success in the rapidly changing and evolving world of business. Because it is designed for non-business students who seek to learn business essentials to enhance their own area of expertise, the minor provides broad exposure to business concepts and theories. The minor also presents and integrates the major
functional areas in business to solve management problems through the use of IT. Strong written and oral communication skills are expected. Prior to beginning the minor, students must have sophomore standing.

The minor consists of the following MSOM courses. Students must complete five courses for a total of 15 credits. At least eight credits of the minor courses must be unique to the Business Minor and not applied toward any other major, minor, or concentration. *Students must achieve a grade of C or better in each course that is applied toward the minor.

For policies governing all minors, see the Academic Policies chapter of this catalog. The School of Management residency requirement for this minor supersedes the university requirement: at least nine credits must be earned at Mason.

Course Work

Required Courses (12 credits):

- MSOM 300 - Managing Financial Resources Credits: 3
- MSOM 301 - Managing People and Organizations Credits: 3
- MSOM 302 - Managing Information in a Global Environment Credits: 3
- MSOM 303 - Marketing in a Global Economy Credits: 3

Electives (3 credits)

Choose one course from the following:

- MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise Credits: 3
- MSOM 305 - Managing in a Global Economy Credits: 3
- MSOM 306 - Managing Projects and Operations Credits: 3
- MSOM 491 - Special Topics: Business Minor Credits: 3

Notes

These courses may not be taken for credit by SOM majors, except for MSOM 305, which may be used to fulfill the University General Education global understanding requirement.

Students who have already taken and received credit for MGMT 301, MIS 301, MKTG 301, or OM 301 shall substitute courses as follows: MGMT 301 for MSOM 301, MIS 301 for MSOM 302, MKTG 301 for MSOM 303, and OM 301 for MSOM 306. Both courses cannot be taken for credit. Students who have taken and received credit for both ACCT 203 and FNAN 301 shall substitute the combination for MSOM 300. All three courses cannot be taken for credit. Transfer students may transfer a maximum of six credits toward the business minor.

Total: 15 credits

Entrepreneurship Practice Minor
The minor in entrepreneurship practice provides an introduction to the business skills needed to participate in an entrepreneurial business venture. Because it is designed for students who wish to learn the skills essential for successful practice of entrepreneurship, the minor draws on the School of Management's minor in business core courses to provide knowledge of business concepts, while offering exposure to entrepreneurship studies within other disciplines. Students must have completed 30 hours (sophomore standing) to declare the Minor in Entrepreneurship Practice and take the minor courses.

Students must complete five courses for a total of 15 credits. At least eight credits of the minor courses must be unique to the Entrepreneurship Practice Minor and not applied toward any other major, minor, or concentration. Students must achieve a grade of C or better in each course that is applied toward the minor.

For policies governing all minors, see the Academic Policies chapter of this catalog. The School of Management residency requirement for this minor supersedes the university requirement: at least nine credits must be earned at Mason.

Course Work

Required Courses (9 credits)

- MSOM 300 - Managing Financial Resources Credits: 3
- IT 495 - Turning Ideas into Successful Companies Credits: 3
  And one of the following:
  - MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise Credits: 3
  - IT 492 - Senior Design Project I Credits: 3

Electives Courses (6 credits)

Select two courses from the following:

- MSOM 301 - Managing People and Organizations Credits: 3
- MSOM 302 - Managing Information in a Global Environment Credits: 3
- MSOM 303 - Marketing in a Global Economy Credits: 3

Notes:

These courses may not be taken for credit by SOM majors.

Students who have already taken and received credit for MGMT 301, MIS 301, MKTG 301, or OM 301 shall substitute courses as follows: MGMT 301 for MSOM 301, MIS 301 for MSOM 302, MKTG 301 for MSOM 303. Both courses cannot be taken for credit. Students who have taken and received credit for both ACCT 203 and FNAN 301 shall substitute the combination for MSOM 300. All three courses cannot be taken for credit. Transfer students may transfer a maximum of six credits toward the entrepreneurship practice minor.

Total: 15 credits
Bachelor's/Accelerated Master's Program

Accounting, BS/Accounting, Accelerated MS

Return to: School of Management

Phone: 703-993-1880
E-mail: msa@gmu.edu
Web: http://som.gmu.edu/msa

Highly-qualified Mason Accounting majors may apply to the accelerated master's degree program and obtain both bachelor's and master's degrees in accounting after satisfactory completion of a total of 144 credits. Graduates will be exceptionally well-prepared for professional school or a PhD program in accounting or a related discipline.

In the accelerated program, six credits of ACCT 600 level courses can be used to meet both bachelor's and master's degree requirements. These six credits will replace six credits of general electives in the student's undergraduate program. ACCT 600 level courses that can be selected for the accelerated program include ACCT 611, ACCT 651, ACCT 672, and ACCT 692.

This program of study is offered by the Accounting Area within the School of Management.

Application Requirements

Applicants to accelerated master's programs must have completed at least 75 credits that apply to their undergraduate degree (with at least 24 credits earned at Mason).

Students submit an application to the MSA program director with any other supplementary application materials requested by the program. The application includes the proposed conferral date for the undergraduate degree and the two graduate courses that are to be applied to the undergraduate degree.

Admission requirements are as follows: 1) A minimum GPA of 3.00 in at least four accounting courses (e.g., ACCT 203, ACCT 301, ACCT 331 and ACCT 332) with no grade less than a B- in those accounting courses 2) Two recommendation letters from full-time Mason accounting faculty 3) Review and approval by the MSA program director. GMAT is not required.

Interested students should contact the MSA program office for more details about the application process.

Degree Requirements

Students are responsible for familiarization and compliance with the university's Academic Policies contained in this catalog.

On completion and conferral of the undergraduate degree in the semester indicated in the application, the student submits the Bachelor's/Accelerated Master's Transition Form and is admitted to graduate standing. As graduate students, accelerated master's students have an advanced standing. They must meet all master's degree requirements except for the two courses (6 credits) they
completed as undergraduates. Students must begin their master's program the semester immediately following conferral of the undergraduate degree.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the program director. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation. To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition Form.

Master's Degree

Accounting, MS

Banner Code: BU-MS-ACCT

Phone: 703-993-1880
E-mail: msa@gmu.edu

The MS in accounting (MSA) is designed to meet the special needs of new professionals entering the accounting profession. The program allows students to earn a state-of-the-art graduate degree in accounting and also meet requirements to take the Uniform CPA Examination in Virginia and in most other states. The program integrates fundamental business skills and specialized knowledge and skills required by the accounting profession.

Admission Requirements

All students registering for SOM graduate courses must have graduate standing. Nondegree student status is not available. Admission is highly competitive and available to qualified candidates holding a baccalaureate degree in accounting from an AACSB-accredited business school. Applicants are evaluated primarily on their undergraduate record and GMAT performance. For information on the GMAT, go to www.mba.com. Professional work experience is not required. Students begin the program in the fall or spring semester. The priority deadline for application is March 15 for the fall semester and October 15 for the spring semester.

Students can have part- or full-time status. Students completing the MS in accounting course work may elect to further develop their leadership potential by transferring to the MBA with a concentration in accounting. Please refer to the MBA section for more details.

Degree Requirements

Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog.

Required Courses (15 credits)

- ACCT 651 - Advanced Taxation Credits: 3
- ACCT 672 - Governmental and Nonprofit Accounting Credits: 3
Electives Courses (15 credits)

Select 15 credits from the following. (A maximum of six credits may be from the listed MBA courses.)

- ACCT 611 - Advanced Managerial Accounting Credits: 3
- ACCT 690 - Professional Accounting Colloquium Credits: 3
- ACCT 692 - Seminar in Accounting Credits: 3
- ACCT 701 - Business Valuation Credits: 3
- ACCT 708 - Taxes and Business Strategy Credits: 3
- ACCT 741 - Information Technology Auditing Credits: 3
- ACCT 742 - Corporate Governance and Ethics Credits: 3
- ACCT 745 - International Financial Reporting Credits: 3
- ACCT 792 - Seminar in Accounting Credits: 3
- ACCT 796 - Independent Studies/Directed Readings Credits: 1-3
- MBA 638 - Operations Management Credits: 3
- MBA 643 - Managerial Finance Credits: 3
- MBA 701 - Business Analysis and Valuation Credits: 3
- MBA 703 - Financial Markets Credits: 3
- MBA 706 - Investment Analysis Credits: 3
- MBA 708 - Taxes and Business Credits: 3
- MBA 717 - International Finance Credits: 3

Note:

Students may either graduate with an MSA degree on completion of 30 credits or opt into the Mason MBA program. Opting in after completion of the MSA courses may require more hours than the required 48 listed under the MBA Program.

Total: 30 credits

Business Administration, MBA

Banner Code: BU-MBA-BUAD

Phone: 703-993-1880
E-mail: mba@gmu.edu

The Mason MBA Program provides a high-level professional education in business administration. It is offered in both part- and full-time formats. The curriculum integrates functional areas with an emphasis on group work, information technology, and the global business environment.
Admissions Requirements

All students registering for SOM graduate courses must have graduate standing. Non degree student status is not available. Admission is highly competitive and available to all qualified candidates without regard to prior academic major. No previous course work in business administration is required, but a four-year undergraduate degree and a college-level calculus course must be successfully completed before matriculation. Admission is based on a combination of academic, professional, and leadership factors. No portion of the portfolio is considered more important than another; careful consideration is given to every part of the application packet to ensure that the Admission Committee has an accurate profile of a candidate’s professional and academic qualifications. For information on the GMAT, go to www.mba.com. A minimum of two years of professional work experience is recommended before entering the program.

The part-time MBA format commences twice a year: fall and spring semesters. Priority is given to applicants submitting their application by October 15 for the following spring semester and March 15 for the following fall semester. Applications for admission received after October 15 and March 15 will be considered on a space-available basis. The full-time MBA format begins only in the fall and has an application deadline of January 15. International students have an application deadline of January 15.

Degree Requirements

Students are responsible for familiarization and compliance with the Graduate Policies contained in this catalog.

Program Information

The MBA core curriculum effectively integrates functional areas with the use of IT, oral and written communication, and teamwork. The MBA program requires 48 credits: 33 credits of core courses and 15 credits of elective courses. Students complete the degree program in two or three years depending on the cohort selected. Because of the cohort structure, part time students commit to attending classes a minimum of two times per week and full-time students attend classes during the day four days each week. Part-time students are required to enroll in classes during the summer session to complete their degrees on a timely basis.

Core Courses: 33 credits

33 credits of core courses are completed prior to enrollment in electives. Part-time students enroll in at least 6 credits per semester and at least 3 credits each summer. Full-time students enroll in 12 credits per semester, with no expectation for enrollment in the summer session. All MBA students complete the following core courses:

- MBA 603 - Managerial Economics and Decisions of the Firm Credits: 3
- MBA 612 - Managing Costs and Evaluating Performance Credits: 1.5
- MBA 613 - Financial Reporting and Decision Making Credits: 3
- MBA 623 - Marketing Management Credits: 3
- MBA 633 - Statistics for Business Decision Making Credits: 3
- MBA 638 - Operations Management Credits: 3
- MBA 643 - Managerial Finance Credits: 3
- MBA 653 - Organizational Behavior Credits: 3
- MBA 662 - Management of Information Technology Credits: 1.5
- MBA 673 - Legal Environment for Management Credits: 1.5
- MBA 674 - Ethical and Social Environment of Business in the 21st Century Credits: 1.5
- MBA 678 - Strategy and Organizational Leadership Credits: 3
- MBA 795 - Global Business Perspectives Credits: 3
Elective Courses: 15 credits

After completing the core courses, students must complete 15 credits of market-driven elective courses (MBA 700-level). A limited number of courses from outside the MBA Program or through the Consortium of Universities of the Washington Metropolitan Area may be taken as electives with the permission of the program director.

Students may use all or some of their elective credits to fulfill a concentration or a specialization as follows:

Concentrations: 12-15 credits

MBA students may use electives to complete courses leading to a concentration in accounting, entrepreneurship, financial management, information systems management, marketing, or project management.

▲ Accounting (ACCT)

Required courses

- MBA 741 or ACCT 741 - Information Technology Auditing Credits: 3
- MBA 742 or ACCT 742 - Corporate Governance and Ethics Credits: 3
- MBA 743 or ACCT 743 - Corporate Financial Reporting Credits: 3
- MBA 744 or ACCT 744 - Fraud Deterrence and Detection Credits: 3

One course from the following:

- MBA 701 - Business Analysis and Valuation Credits: 3
- MBA 702 - Corporate Financial Policy Credits: 3
- MBA 703 - Financial Markets Credits: 3
- MBA 706 - Investment Analysis Credits: 3
- MBA 708 - Taxes and Business Credits: 3
- MBA 717 - International Finance Credits: 3

Total: 15 credits

▲ Entrepreneurship (ENTR)

Four courses from the following:
- MBA 705 - Venture Capital and Private Finance Credits: 3
- MBA 711 - Entrepreneurship Credits: 3
- MBA 714 - Managing Growth of Small Businesses Credits: 3
- MBA 719 - Entrepreneurship Laboratory Credits: 1.5 (may be taken twice)
- MBA 752 - Turning Ideas into Successful Companies Credits: 3

Total: 12 credits

▲ Financial Management (FM)

Required courses

Five courses from the following:

- MBA 701 - Business Analysis and Valuation Credits: 3
- MBA 702 - Corporate Financial Policy Credits: 3
- MBA 703 - Financial Markets Credits: 3
- MBA 704 - Risk Management and Financial Innovation Credits: 3
- MBA 705 - Venture Capital and Private Finance Credits: 3
- MBA 706 - Investment Analysis Credits: 3
- MBA 717 - International Finance Credits: 3
- MBA 746 - Real Estate Analysis and Valuation Credits: 3
- MBA 747 - Real Estate Finance Credits: 3
- MBA 748 - Real Estate Investment Credits: 3

Total: 15 credits

▲ Information Systems Management (ISM)

Four courses from the following:

- MBA 731 - Business Application and Life Cycle Management Credits: 3
- MBA 732 - Knowledge Management Credits: 3
- MBA 734 - Electronic Commerce and E-Business Credits: 3
- MBA 735 - Systems Thinking for Business Performance Credits: 3
- MBA 737 - Information Technology Governance and Policy Credits: 3
- MBA 738 - Business Intelligence and Data Mining Credits: 3
Total: 12 credits

▲ Marketing (MKTG)

Required courses

- MBA 718 - International Marketing Credits: 3
- MBA 721 - Marketing Decision Systems Credits: 3
- MBA 722 - Consumer Behavior Credits: 3
- MBA 724 - Marketing Communications Credits: 3

Total: 12 credits

▲ Project Management (PMGT)

Required courses

- MBA 712 - Project Management Credits: 3
- MBA 715 - Advanced Project and Program Management Credits: 3

Two courses from the following:

- MBA 725 - Leadership Credits: 3
- MBA 726 - Negotiations Credits: 3
- MBA 731 - Business Application and Life Cycle Management Credits: 3
- MBA 737 - Information Technology Governance and Policy Credits: 3

Total: 12 credits

Specializations: 9-15 credits

MBA students may use electives to complete courses leading to a specialization. Specializations are not formally declared and are not recognized on a student's transcript.
International Business

Choose any three courses from the following list to complete 9 credits.

- MBA 716 - International Business Strategy Credits: 3
- MBA 717 - International Finance Credits: 3
- MBA 718 - International Marketing Credits: 3
- MBA 723 - Supply Chain Management Credits: 3
- MBA 734 - Electronic Commerce and E-Business Credits: 3
- MBA 745 - International Financial Reporting Credits: 3

Tourism and Events Management

The Tourism and Events Management specialization consists of 12 hours of required courses and 3 hours of elective.

Required courses

- MBA 721 - Marketing Decision Systems Credits: 3 or MBA 722 - Consumer Behavior Credits: 3
- TOUR 710 - Advanced Administrative Practices in Tourism and Events Credits: 3
- TOUR 712 - Marketing Tourism and Event Planning Services Credits: 3
- TOUR 720 - Major Events and Convention Management Credits: 3

One course from the following:

- MBA 711 - Entrepreneurship Credits: 3
- MBA 712 - Project Management Credits: 3
- MBA 713 - Human Resource Management Credits: 3
- MBA 714 - Managing Growth of Small Businesses Credits: 3
- MBA 718 - International Marketing Credits: 3
- MBA 724 - Marketing Communications Credits: 3
- MBA 725 - Leadership Credits: 3
- MBA 726 - Negotiations Credits: 3

MSA to MBA option

Students who are admitted to the MSA Program may opt into the MBA program. In order to qualify for the MBA degree, the student will have to fulfill the 33 credit MBA core requirement, however the student will be allowed to make course substitutions for MBA 612 and MBA 613 with appropriate ACCT courses. The student may have to take more than 48 credits to complete the MBA degree. The student will receive only the MBA degree, and will complete either ACCT 795 or MBA 795 but not both. Students considering this option should consult with their academic advisor first.
Total: 48 credits

Executive MBA

Banner Code: BU-MBA-BUEX

Phone: 703-993-1880
Email: emba@gmu.edu

Participants

The Executive MBA is designed for those with a minimum of 7 to 10 years of significant business and professional experience. Participants must have the support of their organizations to attend Friday classes every other week and participate in global and domestic residencies.

Sponsoring organizations have included ATPCO, AMS, Apple Federal Credit Union, Blue Cross/Blue Shield, Booz Allen Hamilton, Case New Holland, the Center for Naval Analyses, Cisco, CSC, DISA, Department of Defense, Department of Homeland Security, EDS, Ernst & Young, Exxon- Mobil, Fannie Mae, Freddie Mac, GE Health care Financial Services, General Dynamics, HP, IBM, KPMG, Level (3) Communications, Lockheed Martin, Man Tech International, Marriott, Nextel, Northrop Grumman, OPM, Orbital Sciences, PamAmSat, Pinkerton Computer Consultants, Raytheon, SAIC, SRA, Sunrise Senior Living, USA Today, the U.S. Army, the U.S. Marine Corps, the U.S. Navy, the U.S. Postal Service, Verizon, World Bank, WR Systems, and Xerox, among others.

Diversity in Learning

Students encounter multiple approaches to learning in the Executive MBA Program. Classroom discussions, team projects, individual reading, team presentations, team problem solving, business simulations, business case analyses, coaching, and domestic and international residencies all contribute to the creative learning environment delivered by the Mason Executive MBA Program.

Cohorts

There are two courses of study a student may take in the Executive MBA Program: the Global Executive MBA Cohort and the National Defense Executive MBA Cohort. Information on cohort courses and schedules may be obtained from the EMBA program office.

Global Executive MBA

The Global Executive MBA cohort completes the program in 21 months, including a summer break between the first and second year. Students attend classes one day per week, on alternating Fridays and Saturdays for four semesters. The program’s focus is management decision making, strategic management of business resources, and leadership. Dedicated faculty, an innovative and relevant curriculum, a global focus, a student-centered program team, and great colleagues contribute to the learning experience of a lifetime. The program is carefully designed to help students master a broad range of executive-level competencies while cultivating expert business-related knowledge of the global economy.

Global EMBA Residencies
Five residency sessions complete the Global EMBA experience:

- **Opening Residency:** The Leader’s View—Focuses on developing a broad understanding of the economic environment of business and the development of high-performing teams.
- **Global Residency:** Global Business Strategies—Encompasses a trip to selected international locations. Professors from local universities provide an introduction to the business environment of each country visited and help prepare students for company visits and meetings with executives from local and multinational firms. Company presentations are delivered by directors and top managers. Housing is provided in business-class hotels, and time is provided for cultural excursions and other activities.
- **Mid Program Residency:** Professional Advancement and Organization Performance—Provides a comprehensive integrated learning experience designed to draw from the first year’s courses and prepare the student for the second year. The residency includes a workshop that pertains to career planning and development.
- **New York Residency:** Financial Markets—Encompasses a trip to New York which concludes EMBA 703 Financial Markets. During this residency, students hear from top managers of financial institutions and visit a number of those institutions to develop a comprehensive understanding of worldwide financial markets.
- **Oxford Residency:** Understanding the European Union—Encompasses a trip to Oxford, England. Includes faculty presentations on the European Union and the variety of European cultures and approaches to doing business worldwide. Site visits to local companies in London are also organized with presentations from senior managers and directors.

**National Defense Executive MBA**

The National Defense Executive MBA cohort completes the program in 17 months starting in the fall semester in the first year, continuing with a compressed summer session the following year and through December of the second year. Students attend classes one day per week, on alternating Fridays and Saturdays for the first year of the program, taking all courses with the Global EMBA students. The second year courses are tailored to the needs of defense industry professionals and meet Fridays and Saturdays every other week. Dedicated faculty from the Mason School of Management and adjunct faculty working in specialty areas of the defense sector; as well as accomplished government, military, and corporate guest speakers, technical experts, and GMU alumni employed in the defense industry; are a part of the National Defense EMBA. The dynamic learning environment brings contemporary challenges of the defense industry right into the classroom.

**National Defense EMBA Residencies**

Three residency sessions complete the National Defense EMBA experience:

- **Opening Residency:** The Leader’s View—Focuses on developing a broad understanding of the economic environment of business and the development of high-performing teams.
- **Interim Session Residency:** Strategic Negotiation Workshop and Site Visits and Seminars related to “Congress and the Government Budgeting Process”
- **Leader One Workshop:** Final Leadership Residency & Capstone Project Presentations
- **Global Residency:** Global Business Strategies—Encompasses a trip to selected international locations. Professors from local universities provide an introduction to the business environment of each country visited and help prepare students for company visits and meetings with executives from local and multinational firms. Company presentations are delivered by directors and top managers. Housing is provided in business-class hotels, and time is provided for cultural excursions and other activities.

**Degree Requirements**

The EMBA program requires successful completion of 54 credit hours of coursework including for-credit residencies. Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog.
Eight Modules

During each seven-week module, students complete two to three courses in an applications-oriented sequence that takes them from developing core management skills through the understanding and application of the tools of business performance to the talents of leadership.

Module 1 and 2:
The Economic and Analytical Foundations of Management

Module 3:
Managing Resources for Performance

Module 4:
The Global Perspective

Modules 5 and 6:
Sustainable Business Performance

Modules 7 and 8:
Leadership and Strategy

Required Courses - First Year

- EMBA 603 - Managerial Economics and the Decisions of the Firm Credits: 3
- EMBA 613 - Financial Reporting and Decision Making Credits: 3
- EMBA 623 - Marketing Management Credits: 3
- EMBA 633 - Statistics for Managers Credits: 3
- EMBA 638 - Strategies for Operations Management: Process and Supply Chain Leadership Credits: 3
- EMBA 643 - Managerial Finance Credits: 3
- EMBA 653 - Organizational Behavior Credits: 3
- EMBA 710 - Business, Government, and the Global Economy Credits: 1.5
- EMBA 712 - International Macroeconomics: Concepts and Country Strategy Credits: 1.5
- EMBA 795 - International Business Environment Credits: 1-3 (must take 3 credits)

Total: 27 credits

Second Year Courses

The remaining credit hours to complete the 54 credit requirement will be dependent upon the cohort (Global EMBA or National Defense EMBA). Courses with variable credits (1-6) are established for each entering class to comply with the second year requirement of 27 credit hours. Courses will be selected from:

- EMBA 612 - Managing Costs and Evaluating Performance Credits: 1-3
- EMBA 660 - Management of Information Technology Credits: 3
Management of Secure Information Systems, MS (SOM)

Banner Code: BU-MS-MSIS

Phone: 703-993-1880
Email: cyber@gmu.edu

The Executive Management of Secure Information Systems MS, an interdisciplinary program offered by the Volgenau School of Engineering, the School of Management, and the School of Public Policy; prepares professionals for the challenges of modern computerized information systems that have become increasingly complex and vulnerable to cyber attacks, resulting in a significant number of government regulations. Consequently, those responsible for the safe, secure, and efficient operation of such systems need to grasp their technical aspects and be familiar with both the principles of management and the public policy impact of regulatory and organizational decisions.

The program is run as a cohort with no electives. The entire program has a duration of 16 months including about seven days of study abroad, which is included in the tuition. Applicants to the program are expected to have at least three years of full-time relevant work experience.

Admission Requirements
Applicant requirements include:

- Application form and application fee.
- A bachelor’s degree from a recognized university or an approved institution, recognized qualifications equivalent to a degree.
- Official copy of transcripts from all colleges and universities attended in the United States and abroad.
- Two professional letters of recommendation.
- Goals statement (statement of how and why applicants would benefit from the program).
- A current resume.
- English proficiency standards as required of all Mason graduate students. In particular, applicants who have earned a bachelors, masters, or doctoral degree from a regionally accredited university in the United States, Canada (excluding province of Quebec), United Kingdom, Ireland, Australia, and New Zealand are considered to have met that standard. All other applicants are required to take an English proficiency examination and meet minimum scores set by Mason in order to be considered for admission. The TOEFL or IELTS exams can be used to meet this requirement. The minimum scores are: TOEFL: IBT (88 total with 20 points minimum in each section); CBT (230); and PBT (570); IELTS – Academic: 6.5 total band score.
- GMAT (recommended score: the mean GMAT scores of an entering class should meet or exceed 550 with an individual minimum of 500) or GRE (recommended score: 1200). The GMAT or GRE may be waived if the applicant’s record demonstrates the ability to succeed in a competitive and quantitative program.
- A minimum of three years of significant full-time work experience is required.

MS-MSIS Degree Requirements

Students are responsible for familiarization and compliance with the Academic Policies in this catalog.

Required Courses (36 credits)

- MSEC 510 - Foundations of Cyber Security Credits: 2
- MSEC 511 - Security Practices in the Enterprise Credits: 2
- MSEC 520 - Networking Principles Credits: 1
- MSEC 620 - Networking Security Credits: 2
- MSEC 630 - Secure Information System Governance, Regulation, and Compliance Credits: 2
- MSEC 640 - Privacy and Ethics in an Interconnected World Credits: 2
- MSEC 641 - Enterprise Security Threats Credits: 1
- MSEC 642 - Enterprise Security Technologies Credits: 2
- MSEC 650 - Seminar: Enterprise Security Case Studies Credits: 1
- PUBP 610 - Organizations, Management, and Work: Theory and Practice Credits: 2
- PUBP 611 - Critical Infrastructure Protection in Theory, Policy and Practice Credits: 2
- TECM 610 - Communications and Leadership Credits: 2
- TECM 615 - Decision Making Using Accounting and Financial Data Credits: 3
- TECM 620 - Economics of Technology Management Credits: 2-3
- TECM 640 - Management of Consulting and Technical Professionals Credits: 1-3
- TECM 703 - Technology Assessment, Evaluation, and Investment Credits: 3
- TECM 735 - Technology Management Capstone Project Credits: 2 or MSEC 720 - Capstone Project in Management of Secure Information Systems Credits: 1-3
- TECM 750 - Global IT Management Credits: 2-4 or MSEC 710 - Global Residency Credits: 1-4

Real Estate Development, MS
The MS in Real Estate Development program is designed to prepare prospective real estate professionals for professional careers and for research and teaching positions by combining academic education with opportunities for experience within real estate development organizations throughout the region. Emphasis is placed in the program on educating and training students using live case studies in partnership with leading real estate development companies. The distinctiveness of the Master’s program in Real Estate Development offered by Mason lies in its curriculum, which has been tailored to strengthen the employment opportunities or mobility of students in non-academic job areas, as well as to prepare the minority of students who might wish to complement their studies with doctoral study in related fields. Students pursue one of three emphases: real estate development, real estate finance, or environment and sustainability.

Admission Requirements

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or higher. In addition, this civil engineering/real estate graduate program requires students to have a basic understanding of real estate development, significant experience in the real estate industry, and/or completion of:

- REAL 500 - Real Estate Development Fundamentals Credits: 3

Degree Requirements

The 36 hour curriculum includes 18 hours of required courses and 18 hours of electives. Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog.

Required Courses (18 credits)

- REAL 500 - Real Estate Development Fundamentals Credits: 3
- REAL 502 - Real Estate Client Leadership and Project Management Credits: 3
- REAL 630 - Innovative Land Use, Approvals and Real Estate Development Credits: 3
- REAL 750 - MSRED Capstone Credits: 3
- GSOM 746 - Real Estate Analysis and Valuation Credits: 3
- GSOM 747 - Real Estate Finance Credits: 3

Elective Courses (18 credits)

Electives may be selected from other REAL courses and available offerings in appropriate areas including the School of Public Policy, the School of Management, the Department of Civil, Environmental, and Infrastructure Engineering, the Department of Geography and Geoinformation Science, and the Department of Environmental Science and Policy.

Students wishing to choose a field for emphasis may select, with the approval of a faculty advisor, 3 elective courses within the field that together constitute an emphasis area. The following are examples of fields for emphasis and courses within each field may be selected.
Real Estate Development Emphasis

Choose 3 courses from among the following:

- CEIE 500 - Land Development Engineering Credits: 3
- CEIE 511 - Introduction to Design and Inventive Engineering Credits: 3
- GGS 550 - Geospatial Science Fundamentals Credits: 3
- GSOM 748 - Real Estate Investment Credits: 3
- PUBP 602 - Regional Economic Development: Strategies and Applications Credits: 3

Real Estate Finance Emphasis

Choose 3 courses from among the following:

- GGS 550 - Geospatial Science Fundamentals Credits: 3
- GSOM 748 - Real Estate Investment Credits: 3
- MBA 603 - Managerial Economics and Decisions of the Firm Credits: 3
- PUBP 721 - Transportation Economics Credits: 3
- PUBP 781 - Entrepreneurship and Economic Development Credits: 3

Environment and Sustainability Emphasis

Choose 3 courses from among the following:

- CEIE 501 - Sustainable Development Credits: 3
- CEIE 550 - Environmental Engineering Systems Credits: 3
- CEIE 555 - Introduction to Environmental Engineering Credits: 3
- CEIE 556 - Environmental Law Credits: 3
- EVPP 638 - Corporate Environmental Management and Policy Credits: 3
- PUBP 745 - Transportation and the Environment Credits: 3

Electives Continued

With prior approval of an advisor, students may design their own emphasis.

Students choosing a field for emphasis will take 3 courses outside the selected emphasis for a total of 9 credits. The following courses may be included as electives by all students:

- REAL 690 - Topics in Real Estate Development Credits: 1-6
- REAL 796 - Directed Reading Credits: 1-6

Total: 36 credits
Technology Management, MS

Banner Code: BU-MS-TECM

Phone: 703-993-1880
Email: techman@gmu.edu

The MS in technology management is designed to provide students with a graduate management education that will help them further their leadership careers in technology and technology-oriented businesses and organizations. With technology innovation and commercialization occurring at an increasing pace and industries becoming more networked and global, business success depends on the successful management of technology. Companies are succeeding with rapid innovation, insightful technology integration, creation of focused technology organizations, and skillful management of complexity. The program addresses how to succeed in this marketplace and emphasizes leadership and management; special considerations of technology innovation, commercialization, introduction, and integration; and methods and approaches of systems thinking.

Students are from the major firms and organizations in the Washington, D.C., region. They average 14 years of work experience, and almost 25 percent of the students already have graduate degrees. Approximately three-quarters of the students work for the private sector, while the remainder works for federal government agencies or departments.

Program graduates receive chief information officer (CIO) certification, in partnership with the federal CIO Council, in addition to their MS degree. The program satisfies the requirements for federal government CIOs that were developed in response to the passage of the Information Technology Management Reform Act. Mason is one of only six institutions certified to offer this qualification and was one of the founding university partners with CIO University.

The program, designed for working professionals, starts in January and lasts for 18 months. Classes are held on the Fairfax Campus on Saturdays from 8 a.m. to 5 p.m. The program is 36 credits and includes a capstone project and an international residency. The international residency is approximately 8 days abroad focusing on global topics in technology management. Previous residency locations included: Taiwan, Japan, Thailand, India, Sweden, England, Germany, Singapore and Korea. Residency cost is included in the tuition.

Admission Requirements

Students must have a bachelor’s degree from an accredited institution, a minimum of three years professional work experience, two professional references, and a GMAT score or other evidence that they can perform graduate-level work.

Degree Requirements

Students are responsible for familiarization and compliance with the university's Graduate Policies contained in this catalog.

Courses with variable credits (2-4) are established for each entering class to comply with the total hour requirement of 36 credit hours.

Course Work

- TECM 610 - Communications and Leadership Credits: 2
- TECM 615 - Decision Making Using Accounting and Financial Data Credits: 3
- TECM 620 - Economics of Technology Management Credits: 2-3
- TECM 635 - Metrics and Statistics for Quality and Project Management Credits: 2-3
• TECM 640 - Management of Consulting and Technical Professionals Credits: 1-3
• TECM 700 - Business Engineering and Change Management Credits: 2
• TECM 702 - Interpersonal Dynamics and Teamwork Credits: 3
• TECM 703 - Technology Assessment, Evaluation, and Investment Credits: 3
• TECM 704 - Planning and Control of Projects Credits: 3
• TECM 720 - Analysis of IT Industries Credits: 2-4
• TECM 735 - Technology Management Capstone Project Credits: 2
• TECM 740 - Management of Client Relationships Credits: 1-3
• TECM 745 - Business Functions and Operations: Client Industries Credits: 3
• TECM 750 - Global IT Management Credits: 2-4

Total: 36 credits
School of Public Policy

3351 Fairfax Drive, MS 3B1
Arlington, VA 22201
Phone: 703-993-2280
Web: policy.gmu.edu
E-mail: spp@gmu.edu
College Code: PP

The transformations of local, regional, national and global institutions pose critical challenges for an increasingly complex society. Solving those challenges requires an interdisciplinary approach to policy making. The School of Public Policy (SPP) is committed to transcending traditional boundaries in policy formation while integrating real-world experience and problem-solving into public policy education. With an emphasis on applied knowledge, SPP teaches the methodological and communication skills graduates need to design and promote effective policies.

The School’s programs focus on the interplay among economic, political, social and cultural forces that shape policy outcomes. As such, the School’s faculty members have diverse backgrounds, ranging from economics to political science, anthropology and law. They are experts in diverse topic areas, including transportation, economic development, national security, ethics, health care, global trade, education, governance, and technology.

Administration

Edward Rhodes, Dean
Ann C. Baker, Senior Associate Dean
Jonathan L. Gifford, Associate Dean for Research and Development
Matthys van Schaik, Associate Dean for Academic Affairs
William H. Coester, Assistant Dean for Human Resources and Planning
Elizabeth C. Eck, Assistant Dean for Program Management
Jill V. Emerson, Assistant Dean for Student Affairs

Faculty


Associate Faculty

Avruch, Conlan, Guagnano, Heelo, Hennessey, Mahler, Paden, Regan, Scimecca

Research and Term Faculty
Adjunct Faculty

Clendenin, DiGiulian, Gaske, Gordon, Kewley, Miller, Muhlhausen, Pasurka, Rogowsky, Stabile, Sullivan, Thompson

Faculty Emeritus

Armor, Hill, Kash

Course Work

SPP offers courses designated PUBP, ITRN, ODKM and TELE in the Courses chapter of this catalog.

Law and Public Policy, Joint Degree Program

The School of Public Policy and the School of Law offer a joint JD/MPP degree program in law and public policy studies. For more information, go to www.law.gmu.edu/academics/llm.html.

Academic Policies

Students should become familiar with the university's general academic policies in addition to those specific to each academic unit. Please see the Academic Policies section of the catalog.

Student Appeal and Grievance Procedures

The School of Public Policy has student appeal and grievance procedures laid out in its bylaws. These are based on George Mason University's honor system. Students are responsible for understanding the provisions of the code that are described in detail in this catalog.

Students may appeal decisions concerning academic actions (excluding termination or dismissal) in writing to the Assistant Dean of Student Affairs, who will consider the merit of these appeals in consultation with the relevant program director. Decisions of the Assistant Dean of Student Affairs may be appealed to the Associate Dean of Academic Affairs, whose decision is final.

Grade appeals are made to the Dean. Students should contact the Associate Dean for Academic Affairs in writing to initiate the process. The Dean's decision is final.

There is no right to appeal an automatic termination/dismissal itself. However, a student may be entitled to appeal the grade that leads to the automatic termination/dismissal, or a reconsideration of the grade that led to this situation, either of which may result in not going forward with the termination/dismissal.

A student who is dismissed from the program for any other reason may appeal the decision to the Dean. This appeal must be in writing and must be received within 30 calendar days of the date on the notice of dismissal or termination. The Dean will appoint a committee to review the appeal. This committee will make a recommendation to the Dean concerning the appeal. The Dean will make a final determination. This determination may not be appealed.

Students with grievances should direct them in writing to the Assistant Dean for Student Affairs, who will provide guidance on how to resolve their concerns in accordance with established university procedures.
Research Centers

Center for Aerospace Policy Research
Director: Kenneth J. Button, PhD

The mission of the Center for Aerospace Policy is to develop the U.S. aerospace sector by providing educational and research resources. The center helps national agencies, such as NASA, enhance their internal efficiency and smooth the interface between U.S. agencies and other government agencies, the private sector, and foreign counterparts.

Center For Emerging Market Policies
Co-Directors: Andrew Hughes-Hallet, DPhil and Sonia Ketkar, PhD

This center aims to be a premier research and teaching hub on international commerce, economics and public policy issues relating to emerging markets. It leverages Mason's and the School of Public Policy's considerable expertise on and interest in emerging markets to promote pioneering applied research on emerging markets in Asia, Central and Eastern Europe, Latin America and elsewhere.

Center For Energy Science and Policy
Co-Directors: David M. Hart, PhD and Allison McFarlane, PhD

This center, a joint initiative of the College of Science and School of Public Policy, provides objective analysis of key issues in the energy field that is grounded in original research. It serves as a center of gravity for the many researchers at George Mason whose work engages them with these issues and connects them with decision-makers in the economy, society, and government.

Center for Entrepreneurship and Public Policy
Director: Zoltan Acs, PhD

Economic development policy has shifted dramatically from a business and industry attraction strategy to a more entrepreneurial approach. The Center for Entrepreneurship and Public Policy focuses on entrepreneurship policy research and program delivery, offering programs in research, collaboration, and analysis.

Center for Global Policy
Director: Jack Goldstone, PhD

This center conducts research on a wide range of global policy issues, including foreign trade, democratization and statebuilding, and transnational networks. It also analyzes specific policy issues for a variety of government agencies, and develops and serves as the home to several major cross-national databases for global policy.

Center for Regional Analysis
Director: Stephen Fuller, PhD

Focusing on economic development in technologically intensive regions, the Center for Regional Analysis (CRA) maintains a corporate technology database for the national capital region. The CRA provides economic forecasting services to government agencies at all levels around the world.

Center for Science and Technology Policy
Director: David M. Hart, PhD
This center helps facilitate the exchange of information and ideas among the worldwide science, foreign affairs, trade, and technology communities. Areas of emphasis include international trade and science and technology.

**Center for the Study of International Medical Policies and Practices**  
**Director:** Arnauld Nicogossian, MD

This center provides leadership and focus on global medical and public health policies and processes, working collaboratively with health, science, and medical organizations in the public and private sectors, and academic organizations to address pressing global policy concerns.

**Center For Transportation Policy, Operations and Logistics**  
**Director:** Kenneth J. Button, PhD

This center works with federal and state authorities to find better ways to manage existing transport networks from surface to air to space. The center is active in the areas of intelligent transportation systems and aviation policy.

**International Center for Applied Studies in Information Technology**  
**Director:** Stephen Ruth, PhD

The International Center for Applied Studies in Information Technology (ICASIT) is a consulting group dedicated to delivering the power of the Internet to businesses, underserved markets, and developing countries. ICASIT has contracts in more than 20 countries.

**State Economic Development Center**  
**Director:** Kingsley E. Haynes, PhD

This center’s focus is on providing education, training, and research support for state-level economic development policy and programs. While the primary goal is to provide assistance to agencies and organizations in Virginia, the center also works with other government organizations in the United States as well as abroad. Methods employed by the center include roundtable discussions, formal focus groups, survey research, statistical analysis, and mathematical models.

**Terrorism, Transnational Crime and Corruption Center**  
**Director:** Louise I. Shelley, PhD

The Terrorism, Transnational Crime and Corruption Center (TraCCC) is the first center in the United States devoted to understanding the links among terrorism, transnational crime and corruption. The center teaches, researches and formulates policy on these critical issues. TraCCC accomplishes its mission through international research partnerships engaging in fundamental and applied research projects. Research addresses such diverse concerns as national security, economic development and human rights.

**Transportation and Economic Development Research Center**  
**Director:** Brien Benson, PhD

The Transportation and Economic Development Research Center is a University Transportation Center, funded by the Research and Innovative Technology Administration of the U.S. Department of Transportation. The Center conducts research in transportation finance, transportation and land use, and entrepreneurship and innovation in transportation.
Master's Degree

Health and Medical Policy, MS (SPP)

Banner Code: PP-MS-HMP

Phone: 703-993-2280

The master's program in health and medical policy is offered jointly by the School of Public Policy and the College of Health and Human Services. It prepares students to become health and medical systems policy analysts, consultants, and public health advocates in the US and internationally. It provides students with the knowledge, skills and abilities needed to develop improved national/international health and systems planning, decision-making and to support policy formulation for health and medical professionals, health systems development, resource allocation, and advocacy for national/international public health. Students applying to the program will be admitted to one of two concentrations: Global Medical Policy or Health Policy.

The Global Medical Policy concentration is geared towards students interested in global medical policy formulation. The concentration is designed to prepare students with the background knowledge, analytic skills, and strategic thinking necessary to identify medical practice and international health organizations/systems impacted by globalization.

Admission Requirements

The following requirements are for students applying to the Global Medical Policy concentration (selected at the time of application):

Completed applications for fall and spring semesters are reviewed on a rolling basis, with late applications considered on a space-available basis. Applicants must hold a bachelor’s degree from a regionally accredited institution, with a preferred GPA of 3.00 or higher on a 4.00 scale.

The following items must be included when applying:

- Graduate application with fee (no fee waivers)
- 750 - 1,000 word written statement of student's goals and interest in the program
- Current résumé
- Two official transcripts of all university work completed. International students must also submit a translation of all international transcripts into English, if applicable.
- Two letters of recommendation, with at least one from an individual who is qualified to attest to the candidate’s academic potential.
- For international applicants, TOEFL scores with a minimum score of 575 on the paper-based exam; 230 on the computer-based exam; or 88 with a minimum of 20 on each of the subsections on the Internet-based exam. IELTS will be accepted in lieu of the TOEFL; minimum of 6.5 required. Students may be required to take additional English language testing and/or may be referred to the Center for International Student Access for additional language preparation.
- Certificate of Financial Responsibility (for students requesting an F-1 or J-1 visa).

Submission of GRE or GMAT scores is required only for students requesting merit-based funding consideration.

Students may be admitted for nondegree study and apply a limited number of credits toward the master’s degree should they choose to apply to the degree program later, in accordance with university policy.

Academic Policies
Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

**Degree Requirements**

Students complete 42 hours of course work through a combination of common core courses and concentration courses in the chosen concentration.

**Health and Medical Policy Common Core**

**Health and Medical Systems (6 credits)**

- HAP 609 - Comparative International Health Systems Credits: 3 or equivalent
- HAP 715 - Health Economics Credits: 3 or equivalent

**Public Policy Process (6 credits)**

- PUBP 700 - Theory and Practice in Public Policy Credits: 3 or equivalent
- PUBP 730 - US National Policy Systems and Theory Credits: 3 or equivalent

**Policy Analysis (9 credits)**

- HAP 710 - Inferential Statistics in Health Services Research and Management Credits: 3 or PUBP 704 - Statistical Methods in Policy Analysis Credits: 3
- HAP 730 - Health Care Decision Analysis Credits: 3 or PUBP 713 - Policy and Program Evaluation Credits: 3
- HAP 645 - Introduction to Health Services Research Credits: 3 or PUBP 710 - Topics in Public Policy Credits: 1-3 (Global Medical Systems Policy)

▲ **Global Medical Policy Concentration (GMP)**

Within School of Public Policy

**Required Courses (15 credits)**

- PUBP 757 - Public Policy in Global Health and Medical Practice Credits: 3
• PUBP 758 - Global Threats and Medical Policies Credits: 3
• PUBP 710 - Topics in Public Policy Credits: 1-3
  (Transportation and Medical Policy - 3 credits) and
  (Global Comparative Medical Practices, Ethics and Law - 3 credits)
• PUBP 795 - Final Project Credits: 1-3

Electives (6 credits)

Electives may be drawn from PUBP, CONF, GCH and HAP courses, approved by the academic advisor.

Total: 42 credits

International Commerce and Policy, MA

Banner Code: PP-MA-ICP
Phone: 703-993-2280

The International Commerce and Policy (ICP) Program is an interdisciplinary course of study to help students from around the world prepare for jobs in the new economy. Unlike traditional international affairs programs, the degree is focused on such international economic issues as global trade and investment. The MA in international commerce and policy differs from an MBA program by providing training in the political, social, and technological aspects of the global economy. In today’s world, it is critical for all participants in global markets to understand the multifaceted environment in which they work.

The core faculty is augmented by adjunct faculty members who bring a wealth of practical knowledge and experience, as well as strong academic qualifications to the program. Adjuncts are drawn from the U.S. Commerce and State Departments, the Office of the U.S. Trade Representative, and the International Trade Commission, among other government agencies, as well as from the private sector, the think tank community, and trade associations.

Courses are offered primarily in the late afternoon and evening to fit the schedules of busy professionals. In addition to classroom study, the program emphasizes experiential learning by supporting student internships, cooperative education, and research activities with private- and public-sector employers, and sponsoring a variety of study-abroad experiences.

Admission Requirements

Students from all academic backgrounds are welcome to apply; however, some knowledge of economics, preferably through at least two undergraduate economics courses, is encouraged. While many students may have prior educational and work-related training in business and economics, others see the ICP Program as a bridge from government, education, and other non business occupations to careers in the global economy.

Complete applications for fall and spring semesters are reviewed on a rolling basis, with late applications considered on a space-available basis. Applicants must hold a bachelor’s degree from a regionally accredited institution, with a preferred GPA of 3.00 or higher on a 4.00 scale.

The following items must be included when applying:

• Graduate application with fee (no fee waivers)
• 750 - 1,000 word written statement of student’s goals and interest in the program
• Current résumé
• Two official transcripts of all university work completed. International students must also submit a translation of all international transcripts into English, if applicable.
• Two letters of recommendation, with at least one from an individual who is qualified to attest to the candidate’s academic potential.
• For international applicants, TOEFL scores with a minimum score of 575 on the paper-based exam; 230 on the computer based exam; or 88 with a minimum of 20 on each of the subsections on the Internet-based exam. IELTS will be accepted in lieu of the TOEFL; minimum of 6.5 required. Students may be required to take additional English language testing and/or may be referred to the Center for International Student Access for additional language preparation.
• Certificate of Financial Responsibility (for students requesting an F-1 or J-1 visa).

Submission of GRE or GMAT scores is required only for students requesting merit-based funding consideration.

Students may be admitted for non degree study and apply a limited number of credits toward the master’s degree should they choose to apply to the degree program later, in accordance with university policy.

Academic Policies

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

Degree Requirements

The ICP Program requires 42 credits of course work. All degree candidates must take 30 credits of work in the required courses, as described below. The remaining 12 credits consist of electives that may include internships, independent studies, and study abroad. Students new to the program complete core courses first to prepare for higher-level course work.

SPP Common Core (8 credits)

• PUBP 502 - Governance and Policy Processes Credits: 1-4
• PUBP 503 - Culture, Organization, and Technology Credits: 1-4

ICP Core Courses (22 credits)

• ITRN 500 - Global Political Economy Credits: 1-4
• ITRN 501 - Methods of Analysis for International Commerce and Policy Credits: 4
• ITRN 503 - Investment and Macroeconomics Credits: 1-4
• ITRN 504 - Trade and Microeconomics for International Commerce Credits: 1-4
• ITRN 602 - International Financial Institutions and Globalization Credits: 3
• ITRN 603 - International Trade Relations Credits: 3

Electives (12 credits)

Students have the option to declare a substantive area of emphasis and focus their electives accordingly. The following areas are offered:
Organization Development and Knowledge Management, MS

Banner Code: PP-MS-ODKM

Phone: 703-993-2280

The MS in Organization Development and Knowledge Management (ODKM) Program is an integrated program taught in executive format and designed for professionals who have several years of work experience. Providing conceptual tools and practical guidance to foster organizational change, the program focuses on three related areas: creating and leveraging knowledge through networks of people who communicate and collaborate; understanding and managing change by integrating the diverse roles of people, processes, and technology; and enhancing and facilitating collaboration by building effective relationships in technology-rich environments. A feature of this program is the group-oriented approach to learning supported by the use of web-based collaborative computer technologies. Students develop the competencies to apply these technologies to make organizations more effective.

The cohort usually completes the program on a part-time basis. Full-time study is also possible by arrangement with the program director.

Admission Requirements

Students are considered for admission for the fall term only. Complete applications are reviewed on a rolling basis, with late applications considered on a space-available basis. Applicants must hold a bachelor’s degree from a regionally accredited institution, with a preferred GPA of 3.00 or higher on a 4.00 scale.

The following items must be included when applying:

- Graduate application with fee (no fee waivers)
- 750 - 1,000 word written statement of goals and interest in the program
- Current résumé
- Two official transcripts of all university work completed. International students must also submit a translation of all international transcripts into English, if applicable.
- Two letters of recommendation, with at least one from an individual who is qualified to attest to the candidate’s academic potential.
- For international applicants, TOEFL scores, with a minimum score of 575 on the paper-based exam; 230 on the computer-based exam; or 88 with a minimum of 20 on each of the subsections on the Internet-based exam. IELTS will be accepted in lieu of the TOEFL; minimum of 6.5 required. Students may be required to take additional English language testing and/or may be referred to the Center for International Student Access for additional language preparation.
- Certificate of Financial Responsibility (for students requesting an F-1 or J-1 visa).

Submission of GRE or GMAT scores is required only for students requesting merit-based funding consideration.
Academic Policies

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

Degree Requirements

ODKM is a 36- to 39-credit executive format program. Students work in teams and complete most of the courses in sequence. The second academic year includes an action learning component, in which participants undertake projects in organizations and apply research methods. Overall, the process and methods of evaluation stress the cumulative development of competencies and the capacity to apply the insights gained. Students are expected to have easy access to a computer and the Internet. Minimum computer specifications can be obtained from the program office. Successful completion of the following courses is necessary to fulfill the course requirements of the program.

SPP Common Core (8 credits)

- PUBP 502 - Governance and Policy Processes Credits: 1-4
- PUBP 503 - Culture, Organization, and Technology Credits: 1-4

Core Courses (13 credits)

- ODKM 700 - Organizations, Management and Work: Theory and Practice Credits: 3
- ODKM 710 - Social and Organizational Inquiry Credits: 4
- ODKM 715 - Creating Learning Organizations Credits: 3
- ODKM 720 - Collaborative Technologies for Knowledge Sharing Credits: 3

Additional Requirements (12 credits)

- ODKM 705 - Group Dynamics and Team Learning Credits: 3
- ODKM 725 - Strategic Knowledge Management Credits: 3
- ODKM 735 - Organizational Development Practices Credits: 3
- ODKM 740 - Learning Community Credits: 3

Electives (3 credits)

The elective must be approved by the program director or advisor.

Experiential Requirement (0-3 credits)
A 3-credit internship is required. For students with appropriate work experience, this requirement can be waived with the approval of the program director or dean.

- PUBP 794 - Internship Credits: 1-6

Total: 36-39 credits

Peace Operations, MS

Banner Code: PP-MS-PO

Phone: 703-993-2280

This program is designed for students and practicing professionals engaged in the planning, regulation, management, and conduct of peace operations. Students obtain a working knowledge of the theory, policy, law, research, and practices required to effectively and efficiently participate in or conduct a peace operation. Students also learn to think critically and analytically about the problems and challenges in this field and communicate their analyses clearly and effectively through written and oral presentations.

Admission Requirements

Complete applications for fall and spring semesters are reviewed on a rolling basis, with late applications considered on a space-available basis. Applicants must hold a bachelor’s degree from a regionally accredited institution, with a preferred GPA of 3.00 or better on a 4.00 scale.

To apply, applicants must submit the following:

- Graduate application with fee (no fee waivers)
- 750 - 1,000 word written statement of goals and interest in the program
- Current résumé
- Two official transcripts of all university work completed. International students must also submit a translation of all international transcripts into English, if applicable.
- Two letters of recommendation, with at least one from an individual who is qualified to attest to the candidate’s academic potential.
- For international applicants, TOEFL scores, with a minimum score of 575 on the paper-based exam; 230 on the computer-based exam; or 88 with a minimum of 20 on each of the subsections on the Internet-based exam. IELTS will be accepted in lieu of the TOEFL; minimum of 6.5 required. Students may be required to take additional English language testing and/or may be referred to the Center for International Student Access for additional language preparation.
- Certificate of Financial Responsibility (for students requesting an F-1 or J-1 visa).

Submission of GRE or GMAT scores is required only for students requesting funding consideration.

Academic Policies

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.
Degree Requirements

Students must complete 39 credits as follows:

### SPP Common Core (8 credits)

- PUBP 502 - Governance and Policy Processes Credits: 1-4
- PUBP 503 - Culture, Organization, and Technology Credits: 1-4

### Peace Operations Core Courses (16 credits)

- PUBP 650 - Peace Operations I Credits: 3
- PUBP 651 - Peace Operations II Credits: 3
- PUBP 652 - Experiential Applications Credits: 4
- PUBP 653 - The Interagency Process Credits: 3
- PUBP 654 - Analysis for Peace Operations Credits: 3

### Electives (15 credits)

Electives may be drawn from PUBP and ITRN courses and must be approved by the program director or advisor.

Total: 39 credits

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Public Policy, EMPP

Banner Code: PP-EMPP-PUBP

Phone: 703-993-2280

The executive master’s in public policy program offers a custom-designed degree for a select group of mid-career persons with a significant level of experience and professional promise in the field of public policy. Cohorts meet in executive format to allow for accelerated progress toward degree completion. Classes meet at the Arlington campus on a special schedule to accommodate the working professional.

Admission Requirements

Only applicants who are already successful in public policy or a related field are eligible for admission. Five years of experience and a 3.0 undergraduate GPA are the minimum requirements for consideration. For additional requirements and deadlines, please visit: [http://policy.gmu.edu/admissions](http://policy.gmu.edu/admissions)
Academic Policies

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

Degree Requirements

Students must complete 30 credits of course work through a combination of core and approved special topics courses.

Required Core Courses (24 credits)

- PUBP 502 - Governance and Policy Processes Credits: 1-4
- PUBP 503 - Culture, Organization, and Technology Credits: 1-4
- PUBP 700 - Theory and Practice in Public Policy Credits: 3
- PUBP 704 - Statistical Methods in Policy Analysis Credits: 3
- PUBP 713 - Policy and Program Evaluation Credits: 3
- PUBP 720 - Managerial Economics and Policy Analysis Credits: 3
- PUBP 741 - U.S. Financial Policy Processes and Procedures Credits: 3
- ITRN 503 - Investment and Macroeconomics Credits: 1-4

Electives (6 credits)

Students take two approved special topics courses to fulfill this requirement.

Total: 30 credits

Public Policy, MPP

Banner Code: PP-MPP-PUBP

Phone: 703-993-2280

The master’s program in public policy leads to a degree for aspiring or experienced professionals who seek career advancement through cutting-edge education and training in policy analysis and development in increasingly technical and global environments. The program prepares students to be reflective practitioners who develop, implement, manage, analyze, evaluate, and effect innovative change in the public and private sectors through a course of study that emphasizes the fundamentals of policy development; the role of technology, analytic assessment, and modeling for policy evaluation; and the implications of international and global perspectives on policy formation. Courses are offered primarily in late afternoon and evening to fit the schedules of busy professionals.

Admission Requirements
Completed applications for fall and spring semesters are reviewed on a rolling basis, with late applications considered on a space-available basis. Applicants must hold a bachelor’s degree from a regionally accredited institution, with a preferred GPA of 3.00 or higher on a 4.00 scale.

The following items must be included when applying:

- Graduate application with fee (no fee waivers)
- 750 - 1,000 word written statement of student’s goals and interest in the program
- Current résumé
- Two official transcripts of all university work completed. International students must also submit a translation of all international transcripts into English, if applicable.
- Two letters of recommendation, with at least one from an individual who is qualified to attest to the candidate’s academic potential.
- For international applicants, TOEFL scores with a minimum score of 575 on the paper-based exam; 230 on the computer-based exam; or 88 with a minimum of 20 on each of the subsections on the Internet-based exam. IELTS will be accepted in lieu of the TOEFL; minimum of 6.5 required. Students may be required to take additional English language testing and/or may be referred to the Center for International Student Access for additional language preparation.
- Certificate of Financial Responsibility (for students requesting an F-1 or J-1 visa).

Submission of GRE or GMAT scores is required only for students requesting merit-based funding consideration.

Students may be admitted for nondegree study and apply a limited number of credits toward the master’s degree should they choose to apply to the degree program later, in accordance with university policy.

**Academic Policies**

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

**Degree Requirements**

Students must complete 39 to 42 credits of course work through a combination of core courses, a sequence of courses in their area of emphasis, and a professional experience requirement. Appropriate professional experience can be demonstrated through previous employment or a supervised internship. Students will also be exposed to the global nature of public policy activity through the core requirement of international comparative policy assessment. One of the courses in the emphasis sequence will also have an international focus. The plan of study includes the following:

**SPP Common Core (8 credits)**

- PUBP 502 - Governance and Policy Processes Credits: 1-4
- PUBP 503 - Culture, Organization, and Technology Credits: 1-4

**Required Public Policy Courses (19 credits)**

- PUBP 700 - Theory and Practice in Public Policy Credits: 3
- PUBP 704 - Statistical Methods in Policy Analysis Credits: 3
- PUBP 720 - Managerial Economics and Policy Analysis Credits: 3
- PUBP 741 - U.S. Financial Policy Processes and Procedures Credits: 3
Substantive Policy Emphases (12 credits)

Electives are chosen from one of the following policy emphases:

- Global Medical and Health Policy
- International Governance and Institutions
- National Security and Public Policy
- Public Finance and Budgeting
- Regional Economic Development
- Science and Technology Policy
- Social Policy
- Terrorism, Transnational Crime and Corruption
- Transportation Policy
- Urban Policy and Development
- US Government Institutions and Policy Management

Professional Experience Requirement (0-3 credits)

Certification that the student has experience in the public policy process outside the classroom and is ready to take leadership responsibilities must be exhibited by one of two ways: relevant professional experience, approved by the program director, or an approved internship.

- PUBP 794 - Internship Credits: 1-6

Total: 39-42 credits

Telecommunications Policy, MA

Banner Code: PP-MA-TCMP

Phone: 703-993-2280

The Telecommunications Policy program explores the way language, culture, and technology intersect with management, regulation, and commerce to shape public policies at all levels of government and industry. The program cuts across traditional academic lines to seek best practices for dealing with a number of issues, such as which products should be taxed, whether or not controlled monopolies should be dismantled in favor of free enterprise, and how instantaneous communications are changing the fabric of society at large. Students enrolled in this program will develop a solid theoretical foundation while at the same time explore practical applications of their studies.
Admission Requirements

Complete applications for fall and spring semesters are reviewed on a rolling basis, with late applications considered on a space-available basis. Applicants must hold a bachelor’s degree from a regionally accredited institution, with a preferred GPA of 3.00 or higher on a 4.00 scale.

The following items must be included when applying:

- Graduate application with fee (no fee waivers)
- 750 - 1,000 word written statement of student’s goals and interest in the program
- Current résumé
- Two official transcripts of all university work completed. International students must also submit a translation of all international transcripts into English, if applicable.
- Two letters of recommendation, with at least one from an individual who is qualified to attest to the candidate’s academic potential.
- For international applicants, TOEFL scores with a minimum score of 575 on the paper-based exam; 230 on the computer based exam; or 88 with a minimum of 20 on each of the subsections on the Internet-based exam. IELTS will be accepted in lieu of the TOEFL; minimum of 6.5 required. Students may be required to take additional English language testing and/or may be referred to the Center for International Student Access for additional language preparation.
- Certificate of Financial Responsibility (for students requesting an F-1 or J-1 visa).

Submission of GRE or GMAT scores is required only for students requesting merit-based funding consideration.

Students may be admitted for nondegree study and apply a limited number of credits toward the master’s degree should they choose to apply to the degree program later, in accordance with university policy.

Academic Policies

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

Degree Requirements

The Telecommunications Policy program requires 35 credit hours of coursework. Students should consult with their academic advisor on appropriate course sequencing:

SPP Common Core (8 credits)

- PUBP 502 - Governance and Policy Processes Credits: 1-4
- PUBP 503 - Culture, Organization, and Technology Credits: 1-4

Telecommunications Policy Core Courses (15 credits)

- PUBP 700 - Theory and Practice in Public Policy Credits: 3
Electives (12 credits)

After completion of twelve credit hours of core coursework, electives may be selected from one of the two following emphasis areas:

- Telecommunications Policy
- International Telecommunications

Total: 35 credits

Transportation Policy, Operations, and Logistics, MA

Banner Code: PP-MA-TPOL

Phone: 703-993-2280

The MA in Transportation Policy, Operations, and Logistics (TPOL) Program is designed for students and practicing professionals engaged in planning, regulating, managing, and operating transportation facilities and services. Students obtain a working knowledge of the theory, policy, law, research, and practices required to effectively and efficiently supply and operate transportation facilities and services. They also learn to think critically and analytically about the problems and challenges in this field and communicate their analyses clearly and effectively through written and oral presentations.

Admission Requirements

Completed applications for fall and spring semesters are reviewed on a rolling basis, with late applications considered on a space-available basis. Applicants must hold a bachelor’s degree from a regionally accredited institution, with a preferred GPA of 3.00 or better on a 4.00 scale.

The following items must be included when applying:

- Graduate application with fee (no fee waivers)
- 750 - 1,000 word written statement of goals and interest in the program
- Current résumé
- Two official transcripts of all university work completed. International students must also submit a translation of all international transcripts into English, if applicable.
- Two letters of recommendation, with at least one from an individual who is qualified to attest to the candidate’s academic potential.
• For international applicants, TOEFL scores, with a minimum score of 575 on the paper-based exam; 230 on the computer-based exam; or 88 with a minimum of 20 on each of the subsections on the Internet-based exam. IELTS will be accepted in lieu of the TOEFL; minimum of 6.5 required. Students may be required to take additional English language testing and/or may be referred to the Center for International Student Access for additional language preparation.
• Certificate of Financial Responsibility (for students requesting an F-1 or J-1 visa).
Submission of GRE or GMAT scores is required only for students requesting merit-based funding consideration.

Academic Policies

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

Degree Requirements

The degree requires completion of 36 credits as follows:

SPP Common Core (8 credits)

• PUBP 502 - Governance and Policy Processes Credits: 1-4
• PUBP 503 - Culture, Organization, and Technology Credits: 1-4

TPOL Core Courses (19 credits)

• PUBP 715 - Introduction to Transportation Systems Credits: 3
• PUBP 716 - Transportation Operations and Logistics Credits: 3
• PUBP 717 - Analysis for Transportation Managers Credits: 4
• PUBP 718 - Transportation Planning and Policy Credits: 3
• PUBP 721 - Transportation Economics Credits: 3
• PUBP 722 - Practicum in Transportation Policy, Operations, and Logistics Credits: 3

Electives (9 credits)

Electives must be approved by the program director or advisor.

Total: 36 credits

Master's Level Certificate
Culture and Values in Social Policy Graduate Certificate

Banner Code: PP-CERG-CVSP

SPP offers certificate programs in conjunction with its master’s programs. All certificates require the completion of at least 15 credits (five courses) of work, including a required core course and electives approved in consultation with a faculty advisor.

Students already pursuing a master’s degree in the School of Public Policy may, after admission to a certificate program, earn an additional 9 credits (three courses) in SPP to receive a certificate in addition to the master’s degree.

Participants must be admitted to a certificate program. Admission requirements are the same as those for the master’s programs.

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

The graduate certificate may be pursued on a part-time or full-time basis.

Certificate Requirements

Required Core

- PUBP 700 - Theory and Practice in Public Policy Credits: 3

Electives (12 credits)

Electives may be drawn from the following courses as well as any other PUBP or ITRN course approved by the academic advisor.

- PUBP 650 - Peace Operations I Credits: 3
- PUBP 710 - Topics in Public Policy Credits: 1-3
- PUBP 753 - Ethics in Public Policy Credits: 3
- PUBP 761 - Social Entrepreneurship and Public Policy Credits: 3
- PUBP 762 - Social Institutions and Public Policy Credits: 3
- PUBP 768 - Education and Public Policy Credits: 3
- ITRN 701 - Special Topics in International Commerce and Policy Credits: 1-3

*One of the four electives must have an international focus

Total: 15 credits

Global Medical Policy Graduate Certificate

Banner Code: PP-CERG-GMP
The graduate certificate in Global Medical Policy requires a total of 18 credits (6 courses). The two elective courses are decided in conjunction with an advisor.

Participants must be admitted to the certificate program. Admission requirements are the same as those for the master’s programs.

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

The graduate certificate may be pursued on a part-time or full-time basis.

Certificate Requirements

Required Core (12 Credits)

- PUBP 757 - Public Policy in Global Health and Medical Practice Credits: 3
- or
- GCH 543 - Global Health Credits: 3
- PUBP 758 - Global Threats and Medical Policies Credits: 3
- HAP 609 - Comparative International Health Systems Credits: 3
- PUBP 704 - Statistical Methods in Policy Analysis Credits: 3
- or
- HAP 765 - Methods for Health Policy Analysis Credits: 3

Elective Courses (Choose two of the following):

School of Public Policy Electives

- PUBP 501 - Policy and Organizational Analysis Credits: 4
- PUBP 502 - Governance and Policy Processes Credits: 1-4
- PUBP 503 - Culture, Organization, and Technology Credits: 1-4
- PUBP 710 - Topics in Public Policy Credits: 1-3
- PUBP 713 - Policy and Program Evaluation Credits: 3
- PUBP 720 - Managerial Economics and Policy Analysis Credits: 3
- ITRN 500 - Global Political Economy Credits: 1-4
- ITRN 501 - Methods of Analysis for International Commerce and Policy Credits: 4
- ITRN 602 - International Financial Institutions and Globalization Credits: 3
- ITRN 603 - International Trade Relations Credits: 3
College of Health and Human Services electives

- GCH 560 - Environmental Health Credits: 3
- GCH 590 - International Health Organizations Credits: 3
- GCH 602 - Global Health Issues Related to Violence Credits: 3
- GCH 605 - Social Epidemiology Credits: 3
- GCH 680 - International Research Ethics and Methods Credits: 3
- GCH 712 - Introduction to Epidemiology Credits: 3
- GCH 722 - Infectious Disease Epidemiology Credits: 3
- GCH 732 - Chronic Disease Epidemiology Credits: 3
- HAP 540 - Introduction to Emergency Preparedness/Disaster Recovery for Health Care Professionals Credits: 3
- HAP 715 - Health Economics Credits: 3
- HAP 727 - Program Evaluations in Health Care Credits: 3
- HAP 730 - Health Care Decision Analysis Credits: 3
- HAP 735 - Risk Analysis in Health and Bioscience Credits: 3
- HAP 762 - Cost-Effectiveness for Health Care Management and Policy Decisions Credits: 3

Institute for Conflict Analysis and Resolution Electives

- CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3

Total: 18 credits

Global Trade Management Graduate Certificate

Banner Code: PP-CERG-GTM

SPP offers certificate programs in conjunction with its master's programs. All certificates require the completion of at least 15 credits (five courses) of work, including a required core course and electives approved in consultation with a faculty advisor. Students already pursuing a master’s degree in the School of Public Policy may, after admission to a certificate program, earn an additional 9 credits (three courses) in SPP to receive a certificate in addition to the master’s degree.

Participants must be admitted to a certificate program. Admission requirements are the same as those for the master’s programs.

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

The graduate certificate may be pursued on a part-time or full-time basis.

Certificate Requirements
Required Core

- ITRN 500 - Global Political Economy Credits: 1-4

Electives (12 credits)

Electives may be drawn from the following courses as well as any other PUBP or ITRN course approved by the academic advisor.

- ITRN 602 - International Financial Institutions and Globalization Credits: 3
- ITRN 603 - International Trade Relations Credits: 3
- ITRN 604 - International Trade and Technology Credits: 3
- ITRN 701 - Special Topics in International Commerce and Policy Credits: 1-3
- ITRN 702 - Special Topics in International Commerce and Policy: Study Abroad Credits: 3-6
- ITRN 711 - United States Law and Global Trade Credits: 3
- ITRN 712 - World Trade Organization and Global Trade Credits: 3
- ITRN 740 - ABCs of Exporting and Importing Credits: 3
- ITRN 769 - International Entrepreneurship Credits: 3
- ITRN 770 - International Contract Negotiation Credits: 3
- ITRN 773 - International Strategic Management Credits: 3
- PUBP 710 - Topics in Public Policy Credits: 1-3

Total: 16 credits

National Security and Public Policy Graduate Certificate

Banner Code: PP-CERG-NSP

SPP offers certificate programs in conjunction with its master's programs. All certificates require the completion of at least 15 credits (five courses) of work, including a required core course and electives approved in consultation with a faculty advisor. Students already pursuing a master’s degree in the School of Public Policy may, after admission to a certificate program, earn an additional 9 credits (three courses) in SPP to receive a certificate in addition to the master’s degree.

Participants must be admitted to a certificate program. Admission requirements are the same as those for the master’s programs.

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

The graduate certificate may be pursued on a part-time or full-time basis.

Certificate Requirements
Required Core

- PUBP 700 - Theory and Practice in Public Policy Credits: 3

Electives (12 credits)

Electives may be drawn from the following courses as well as any other PUBP or ITRN course approved by the academic advisor.

- PUBP 650 - Peace Operations I Credits: 3
- PUBP 651 - Peace Operations II Credits: 3
- PUBP 710 - Topics in Public Policy Credits: 1-3
- PUBP 743 - National Security Management and Policy Credits: 3
- PUBP 750 - History of Military Operations Other than War Credits: 3
- PUBP 751 - International Police Operations Credits: 3
- PUBP 755 - National Security Decision-Making Policy Credits: 3
- ITRN 701 - Special Topics in International Commerce and Policy Credits: 1-3
- ITRN 756 - National Security and the Global Economy Credits: 3

* One of the four electives must have an international focus

Total: 15 credits

Transportation and Logistics Policy Graduate Certificate

Banner Code: PP-CERG-TLP

SPP offers certificate programs in conjunction with its master's programs. All certificates require the completion of at least 15 credits (five courses) of work, including a required core course and electives approved in consultation with a faculty advisor. Students already pursuing a master’s degree in the School of Public Policy may, after admission to a certificate program, earn an additional 9 credits (three courses) in SPP to receive a certificate in addition to the master’s degree.

Participants must be admitted to a certificate program. Admission requirements are the same as those for the master’s programs.

Students admitted to an SPP program will be terminated from SPP upon receiving one grade of F and are no longer eligible to take courses in SPP. Per university regulation students are dismissed from the university after accumulating grades of F in two courses or 9 credits of unsatisfactory grades in graduate courses.

The graduate certificate may be pursued on a part-time or full-time basis.

Certificate Requirements

Required Core
Electives (12 credits)

Electives may be drawn from the following courses as well as any other PUBP or ITRN course approved by the academic advisor.

- PUBP 710 - Topics in Public Policy Credits: 1-3
- PUBP 714 - Topics in Transportation Policy, Operations, and Logistics Credits: 1-3
- PUBP 716 - Transportation Operations and Logistics Credits: 3
- PUBP 718 - Transportation Planning and Policy Credits: 3
- PUBP 721 - Transportation Economics Credits: 3
- PUBP 722 - Practicum in Transportation Policy, Operations, and Logistics Credits: 3
- PUBP 723 - Metropolitan Transportation Policy Credits: 3
- PUBP 724 - Intelligent Transportation Systems and Technology Credits: 3
- ITRN 701 - Special Topics in International Commerce and Policy Credits: 1-3

Total: 15 credits

Doctoral Degree

Public Policy, PhD

Banner Code: PP-PHD-PUBP

Phone: 703-993-2280

This program is distinctive in its heavy emphasis on the combined influence of technology, culture, and institutions on public policy. Students investigate the increasing tensions created by technologically driven organizational change.

To investigate the policy issues associated with substantive policy areas, students develop in-depth understanding of American institutions, values, and culture; competence in research methods and advanced analytical methodologies; and a comparative, international perspective. At the time of admission, each student is assigned a faculty advisor who assists in the design and development of the student’s program.

Admission

The program seeks students with exceptional potential for accumulating, sorting, analyzing, and communicating information and findings effectively. Public policy is inherently complex and value laden. In the end, high-quality policy analysis requires thoughtful and judicious management of complex and incommensurate information, both quantitative and qualitative. Potential students must be able to manage and integrate both kinds of information and produce persuasive, well-organized, written syntheses and analytical insight.

The ideal applicant has demonstrated capabilities in research and writing, basic mathematical skills roughly equal to the first semester of calculus, competence in statistics, some background in economics, and a theoretical and working knowledge of
public policy processes. Applicants with strong records who are lacking in one or more of these areas may be admitted to the program and will receive assistance in making up deficiencies.

Applicants must hold a master’s degree from a regionally accredited institution and have a GPA of 3.00 or higher. Prospective students are encouraged to attend an information session.

Please see the Graduate Admissions Policies section in this catalog and online at http://admissions.gmu.edu/grad/ for general information on graduate admission to George Mason University.

The following items should be included when applying:

- Graduate application with fee (no fee waivers)
- 750 - 1,000 word written statement of goals and interest in advanced study in public policy
- Current résumé or vita
- Two official transcripts of all university work. International students must also submit a translation of all international transcripts into English, if applicable.
- GRE or GMAT results; scores should not be older than five years.
- Two letters of recommendation, with at least one from an individual qualified to attest to the candidate’s academic potential
- A writing sample approximately 10 to 20 pages in length, such as a technical report, professional publication, or term or seminar paper
- For international applicants, TOEFL results with a minimum score of 600 on the paper-based exam; 250 on the computer-based exam; or 100 with a minimum of 23 on each of the subsections on the Internet-based exam. IELTS will be accepted in lieu of the TOEFL; minimum of 6.5 required. Students may also be required to be tested by the English Language Institute.
- Certificate of Financial Responsibility (for students requesting an F-1 or J-1 visa)

Students are considered for admission for the Fall term only. The application deadline is February 1 for international students and March 1 for domestic students.

**Reduction of Credit**

Students are required to complete a minimum of 82 credits of course work, of which no more than 12 may be dissertation credits. Up to 30 credits from a prior master's degree may be applied toward the doctoral requirements at the program director's discretion. The program director determines whether the credits are eligible for reduction of credit and the number of credits to be reduced.

**Degree Requirements**

Specific course work requirements include four foundational core courses, one semester of participation in the research colloquium, two advanced methodology courses, three courses in an area of program specialization, and three advanced courses tailored to the student’s research needs and interests. Courses are determined in collaboration with the student's advisor and are drawn widely not only from SPP, but also from other programs at Mason.

As detailed below, at the completion of core skills course work (Stage One), students must pass a qualifying exam that evaluates mastery of the first year’s material, as well as the ability to integrate that material when addressing important and complex public policy problems and issues. Students must then develop their research areas through specialized course work, and then pass a field exam structured around their specific field of proposed doctoral research (Stages Two and Three). Other requirements include the successful preparation and defense of a doctoral research proposal and the ensuing dissertation (Stage Four).

A complete description of the program policies, procedures, and requirements is in the SPP student and faculty handbook, which is published annually.
Stage One - Core Skills

Prerequisites: Methodological and Substantive Foundations

PhD students are required to have competence in these three areas, either by taking these courses or by proving competence through a placement exam and/or evidence of previous relevant course work. Prerequisite courses will not count as part of the 82 credit requirement.

- PUBP 704 - Statistical Methods in Policy Analysis Credits: 3
- PUBP 720 - Managerial Economics and Policy Analysis Credits: 3
- PUBP 730 - US National Policy Systems and Theory Credits: 3

Core Requirements (15-16 credits)

- PUBP 800 - Culture and Public Policy Credits: 1-4
- PUBP 801 - Research Design for Public Policy Credits: 1-4

Students whose final paper in PUBP 801 is deemed unacceptable for a doctoral program must take PUBP 709 the following semester. PUBP 709 will not count as toward the 82 required credits for the degree. Failure to earn a grade of B or better in PUBP 709 may result in dismissal.

- PUBP 804 - Multivariate Statistical Analysis in Public Policy Credits: 4
- PUBP 805 - Foundations of Social Science for Public Policy Credits: 4

Stage Two - Policy Fields and Skills (13 credits)

- Three elective courses
- One advanced methods course
- PUBP 850 - Seminar in Public Policy Credits: 1

Stage Three - Research Foundations (12 credits)

- Field of Study (3 courses)
- Advanced Methods (1 course)
- Field Statement
- Field Exam

Field of Study Requirements

- Students may choose one of the established fields of study or work with a faculty committee to create their own field of study. The established fields in the doctoral program are: Regional Development and Transportation; Technology, Science and Innovation; Entrepreneurship, Growth and Public Policy; U.S. Governance; Culture and Society; Organizational and Information Technology; and Global and International Systems.
• By end of their third semester, full time students (fourth semester for part-time) must choose a chair for their Field Committee.
• By the start of their fourth semester, full time students (fifth semester for part-time) must submit to the chair of their Field Committee a plan for their Field of Study. The Field of Study Plan (max. 1000 words) will describe a proposed research area, including citations relevant to current research in that Field. The Plan must identify three substantive courses and at least one advanced methods course that the student intends to take that will serve as a foundation for the Field. The Plan must be approved by both the student's Field Committee Chair and the Director of the PhD program.
• The three substantive courses must include at least one 800 level course offered in SPP and no more than one substantive graduate course from outside SPP.
• The advanced methods course must be chosen from the approved list for the SPP PhD program, or approved in writing by the Field Committee Chair and Director of the PhD program.
• Where appropriate courses are not available from SPP, students may petition the Director of the PhD program for substitute courses to count for their Field of Study Plan.
• Courses in the Field of Study Plan are intended to be taken concurrently with work on the Field Statement and Field Exam. Students may not present a dissertation proposal for approval until they have passed the Field Exam.

Qualifying Exams

Students must pass both a qualifying exam which is taken after the core courses are completed and a field examination.

When students have completed all coursework, both the qualifying and field exams have been passed, they have an approved dissertation committee and presented and successfully defended a dissertation proposal, they advance to candidacy.

Stage Four - Dissertation (12 credits)

• PUBP 998 - Research/Proposal for Dissertation Credits: 1-9
• Proposal Oral Defense
• PUBP 999 - Dissertation Credits: 1-9 (998 + 999, 12 credits total, at least 6 credits from 999)
• Dissertation Oral Defense

Total: 82 Credits
The College of Science (COS) serves as the nexus for research and education in the natural, mathematical, and computational sciences at Mason. The central mission of COS is to create and disseminate scientific knowledge, provide outstanding scholarship in concert with excellent teaching, and develop the human and technical resources required to address the current and future needs of society. Through its innovative and multifaceted educational and research mission, COS offers exciting opportunities to undergraduate and graduate students, scientists, educators, and other professionals in Northern Virginia and the national capital region.

In addition to the wide variety of undergraduate degree programs offered by its 10 academic units, COS also offers many innovative graduate degrees and interdisciplinary minors. The research strength of COS provides an essential resource to graduate students and to undergraduates whose involvement in research is strongly encouraged. Many undergraduates go on to
graduate school and to pursue careers in public service, nonprofit organizations, and the private sector. Graduate students engage in more specialized study at the master’s and doctoral levels, preparing them for first or second careers or job advancement and providing personal enrichment.

Faculty members are committed to teaching grounded in scholarship and research. They strive to make students rigorous thinkers and clear communicators while encouraging experimentation with new approaches and ideas. Students are thus prepared for their role as informed citizens in a complex, global society and able to adapt to an ever-changing world.

Administration

Vikas Chandhoke, Dean
Evans J. Mandes, Senior Associate Dean for Faculty Matters
Timothy L. Born, Associate Dean for Academic and Student Affairs
Martha Westcoat-Andes, Associate Dean for Administration
Gregory D. Foster, Acting Associate Dean for Research
Vita M. Vock, Assistant Dean for Undergraduate Academic Affairs

Accommodations for Disabled Students

Students with documented disabilities should contact the Office of Disability Services (Student Union I, Room 222; 703-993-2474) to open a file and learn more about accommodations that may be available to them.

Graduate Degree Programs

COS offers 13 master’s degrees and 10 doctoral degrees. The requirements for each degree can be found in the departmental and degree sections and a complete listing of the graduate programs administered by the College of Science is available on the college web site: http://cos.gmu.edu/academics/degree_programs/graduate.

Graduate Admission

Admission decisions are made by the faculty committee of the respective graduate program. Denial of admission is not subject to appeal.

Provisional Admission

Students provisionally admitted to their graduate degree program are not eligible to enroll in consortium course work or study at another institution until the conditions of the provisional contract have been met. Provisionally admitted students are also not eligible to participate in any study abroad programs until the conditions of the provisional contract have been met. Transfer of credit requests for course work taken in non-degree status at Mason or from another institution prior to admission will not be considered until the provisional contract has been fulfilled.

Non-degree Enrollment

Admission to non-degree graduate study at Mason is highly competitive. Among the factors which may be considered in the admissions process are previous academic performance, professional experience, academic fit, and other standards, at the discretion of the College of Science. All non-degree applicants must complete a non-degree online application for admission and supply official transcripts from all postsecondary institutions they have attended. Once admitted to graduate non-degree status, students are considered graduate students and tuition charges are calculated as such, regardless of the level of course(s) in which they are enrolled. Up to twelve (12) credits of graduate coursework earned in non-degree status can be considered for transfer into a graduate program within the College of Science.
Non-degree students are expected to maintain the same academic standards as degree-seeking students. See Academic Termination in the Graduate Policies section of this catalog.

Reduction of Credit

Students accepted into a Doctoral program who have earned a Master’s degree in a relevant field from a regionally accredited institution may be eligible for a credit reduction of up to 30 credits. Students must request a reduction from the Graduate Program Director of the graduate program and reductions must be approved by both the Graduate Program Director of the graduate program and by the Associate Dean of Academic Affairs. Reduction of credit requests from students who are admitted provisionally are not considered until the student has fulfilled the conditions of their admission and had the provisional qualifier removed from their record. Credits used in reduction of credit are not subject to time limits, and the credits must have been applied to a previous degree.

Transfer of Credit

To be eligible for transfer, credits must have been earned at a regionally accredited graduate degree-granting institution (and applicable to a graduate degree at that institution) or at Mason while in non-degree status. Courses accepted for transfer credit must have been completed within six years of the admission term and with a minimum grade of 3.00. Courses with grades of P or S are not accepted for transfer unless the official transcript indicates that the grade is equivalent to a 3.00 (B) or better. Some programs have more stringent standards on transfer of credit; students should contact their graduate program for specific information.

Credit from Other Institutions (Study Elsewhere)

Students enrolled in a degree program may take graduate courses at another regionally accredited institution and apply these credits to a master’s or doctoral degree with prior approval. Approval must be secured in writing from the Graduate Program Director of the graduate program and the Associate Dean of Academic Affairs of the college. Students enrolling in courses at other institutions with different drop/add timetables must still abide by Mason’s drop/add deadlines in terms of acquiring necessary approvals.

Academic Load

Graduate students can enroll in up to 12 credits of course work each semester. Non-degree students can enroll in up to 10 credits of course work each semester.

University Consortium

Students should review university policies regarding the University Consortium under Special Registration Procedures in the Academic Policies chapter of this catalog.

Eligible students may enroll in courses at any of the institutions in the Consortium of Universities in the Washington Metropolitan area. Students are limited to one consortium course per semester, with a career maximum of 6 credits. To register for a consortium course, students must have an overall GPA of at least 3.00 and be in good academic standing. Students with grades of IN on their record or who earned grades of C or F in the most recent semester are not eligible to register for a consortium course. Students who have received a grade less than 3.00 in a consortium course are not permitted to enroll in additional consortium courses. Newly admitted graduate students are not permitted to enroll in consortium courses during their first semester of graduate study. Students who wish to enroll in consortium courses during their second semester of study must wait until the grades for the previous semester have been posted. Credit earned through the consortium is considered resident credit and these grades will count toward the student’s GPA.
Dissertation Committee

The college follows university policies regarding dissertation committees. See Dissertation Committee in the Requirements for Doctoral Degrees section of the Academic Policies chapter of this catalog. Please note that some programs within the College of Science may have a more stringent policy.

Dissertation (998/999) Registration

It is the student’s responsibility to complete registration for dissertation proposal (998) or dissertation research (999) prior to the first day of classes for the semester. If this date is missed, students must still enroll in these courses via Add or Late Schedule Adjustment procedures and are subject to Late Registration fees. Failing to register on time in a particular semester does not alter the requirement for continuous registration in 999.

All registration for doctoral dissertation research (999) must be planned with the dissertation director and approved by the Associate Dean of Academic Affairs. Dissertation research is open only to doctoral students who have advanced to candidacy, and students must register for a minimum of 3 credits of 999 per semester (excluding summers) until they have completed the minimum number of credits of 998 and 999 required by the university and their degree program. Once enrolled in 999, students must maintain continuous registration in 999 each semester until graduation, excluding summers. Students who defend in the summer must be registered for at least 1 credit of 999 in the summer. Students registered in 998 or 999 are graded IP until work in 998 or 999, respectively, is complete; at that time they are graded S/NC. Graduation candidates who miss the library deadline for dissertation submission, but do submit officially before the next semester begins, do not have to register for 999 in that next semester, but must stay active to graduate. Please see section on Special Registration for Non-enrolled Students in the University Catalog.

Time Limit for Doctoral Students

Total time to degree for doctoral students will not exceed eleven (11) calendar years from the time of first enrollment as a doctoral degree-seeking student in a program of the University. Doctoral students are expected to advance to candidacy in no more than six years and to complete all other degree requirements for graduation in no more than five years from the time of advancement to candidacy.

Students who will not meet published time limits because of circumstances beyond their control may petition for an extension. Extensions to the time limit for advancement to candidacy may be granted for a maximum period of one calendar year. The one-year extension granted to advance to candidacy will run concurrently with the five years provided to complete the dissertation so that the total time limit to degree will not exceed eleven (11) years even for those students granted a time extension for advancement to candidacy.

Students who are given permission to re-enroll following an absence from Mason remain subject to their original time limits. Failure to meet the time limits or to secure approval of an extension request may result in termination from the program. International students attending in F-1 or J-1 status have more restrictive limits. Such students should contact the Office of International Programs and Services for further information.

Requests for extension of time limits must be submitted to the Associate Dean of Academic Affairs in writing. They should explain the extenuating circumstances that prevented a timely completion of the degree, corrective action that has been taken to address those circumstances, and a timeline for completing the work within the limits of the extension. The request should include a letter from the student’s graduate program director indicating program support for the extension and confirmation that the work can be completed within the limits of the extension.

Graduate Appeals of Dismissal or Termination

All graduate students should be familiar with the university polices on dismissal and termination as stated in Graduate Academic Standing section of the Academic Policies chapter of this catalog. Students who meet the criteria for dismissal or termination may...
submit a written appeal to the Associate Dean of Academic Affairs. Appeals should include all relevant information on the basis for appeal, as well as any appropriate documentation and a letter of support from the graduate program. Appeals of termination are reviewed by the Associate Dean of Academic Affairs with input from appropriate faculty within the student’s academic unit. The ruling represents the final decision of the college.

Undergraduate Degree Programs

COS offers six bachelor of arts degrees and 12 bachelor of science degrees. These undergraduate degrees consist of course work in university-wide general education, a major area of study, and electives. To earn a bachelor’s degree, students must complete 120 credits, of which at least 45 must be in upper-level courses (numbered 300 and above). At least one course at the 300 or 400 level must be designated “writing intensive.” All entering students who have not yet satisfied the university-wide general education requirement in quantitative reasoning are required to take the math placement test prior to enrollment.

Students should consult the University General Education chapter for information concerning university-wide general education requirements for undergraduate degrees.

All students are responsible for meeting with their academic advisor, and reviewing their transcripts and degree audits regularly to ensure that they are correct and meet all their requirements. Transfer students are encouraged to meet with their academic advisor prior to registering for classes to review their transcripts and course equivalencies. In some cases, students may need to earn more than 120 credits to complete all of their requirements.

A complete listing of the undergraduate programs administered by the College of Science is available on the college web site: http://cos.gmu.edu/academics/undergraduate/degree_programs.

College-Level Degree Requirements

The baccalaureate degree is designed to provide a broad knowledge of the world, develop in students the ability to think conceptually and critically, acquaint them with many different methods of inquiry, and provide skills to continue intellectual growth throughout life.

Bachelor of Arts

The BA degree provides students with a breadth of knowledge, as well as the necessary skills to make in-depth study of a major truly meaningful. In addition to the university-wide general education program, students pursuing a BA degree must complete the course work below, and the courses listed in the departmental sections that follow. Except where expressly prohibited, a course used to fulfill a college-level requirement may also be used simultaneously to satisfy other requirements, such as university-wide general education requirements, college-level requirements, or requirements for the major. In some cases, the COS requirements below may be superseded by requirements of the major degree program.

- Philosophy or religious studies: 3 credits, fulfilled by any course in philosophy or religious studies (PHIL, RELI)
- Social and behavioral science: 3 credits in addition to the university-wide requirement in social and behavioral science for a total of 6 credits. The two courses used to fulfill the combined college and university requirements must be from different disciplines in the social and behavioral sciences. This requirement may be fulfilled by completing any course in ANTH, CRIM, ECON, GOVT, HIST (except 100 or 125), LING, PSYC, or SOCI and these courses in GGS: 101, 103, 110, 301, 303, 304, 305, 306, 315, 316, 320, 325, 330, 357, 380.
- Science: 1 credit in addition to the university-wide requirement for a total of 8 credits. This requirement can be fulfilled by completing two of any approved natural science courses that include a laboratory experience. This requirement may not be fulfilled by BIOL 124 or 125.
- Non-Western culture: 3 credits of an approved course in the study of a non-Western culture in addition to the course used to fulfill the university-wide general education requirement in global understanding. A course used to fulfill the university-wide general education global understanding requirement may not be simultaneously used to satisfy this college-level requirement. A course used to fulfill this requirement may be used simultaneously to fulfill any other
requirements (university-wide general education requirements, college-level requirements, or requirements for the major). This requirement may be fulfilled by any of the following courses: ANTH 114, 300, 301, 302, 304, 305, 306, 307, 308, 309, 311, 313, 314, 323, 330, 332, 381, 396; ARAB 420, 440; ARTH 203, 204, 319, 320, 380, 382, 383, 384, 385, 386, 482; CHIN 318, 320, 325; DANC 118; ECON 361, 362; FREN 451, 454; GGS 101, 316, 325, 330, 399; GOVT 328, 332, 333, 340, 341, 345, 432, 433; HIST 130, 251, 252, 261, 262, 271, 281, 282, 328, 329, 353, 354, 356, 365, 366, 367, 387, 426, 460, 461, 465, 466; JAPA 310; MUSI 103; RELI 211, 212, 272, 313, 314, 315, 337, 374, 375, 490; or RUSS 353, 354. Students who can document attendance at a native school in a non-Western country for at least four years may request a waiver from this requirement through the CHSS Undergraduate Academic Affairs Office.

- **Foreign language:** intermediate-level proficiency in one foreign language. This requirement may be fulfilled by completing a course in a foreign language numbered 202, 209, or 210; or by successfully completing a 300- or 400-level course that requires intermediate-level proficiency and is taught in the foreign language; or by achieving a satisfactory score on an approved proficiency test; or by presenting for admission to George Mason University an approved score on the TOEFL and on the TOEFL essay (for students whose native language is not English). International students should consult the Undergraduate Academic Affairs Office about a possible waiver of the foreign language requirement.

Requirements for each BA major are listed in the departmental sections that follow.

**Bachelor of Science**

The BS degree provides students with a more intensive approach to the technical core knowledge and concepts in their major field of study. Therefore, this curriculum has a reduced number of courses in humanities and social sciences in comparison with the BA degree to allow students to achieve greater depth in their majors. Students pursuing a BS degree must complete the university-wide general education program plus the requirements for their major. Requirements for each BS major in COS are listed in the departmental sections that follow.

**Teacher Licensure**

Degree programs that prepare students for high school teaching careers are available in the following COS departments or programs: Atmospheric, Oceanic and Earth Science; Biology; Chemistry, Mathematics, and Physics. Students who wish to become K-12 teachers, and who plan to seek teacher licensure should also consult the College of Education and Human Development chapter and attend an information session early in their undergraduate career. For more information, call 703-993-2892, e-mail gseadmit@gmu.edu, or go to gse.gmu.edu.

**Minors**

Students may elect to take a minor in addition to their major field of study. For policies governing all minors, see the Academic Policies chapter of this catalog. Students interested in earning a minor should complete the Undergraduate Declaration of Minor form.

**Undergraduate Policies**

Students should become familiar with the university's general academic policies in addition to those specific to each academic unit. Please see the Academic Policies section of this catalog.

**Questions about Academic Policies**

Students with questions regarding exceptions to academic policies and college-level requirements should contact the Undergraduate Academic Affairs Office (Science and Technology Building I, Room 103; cosdean@gmu.edu).

Additional policy information and forms are available online from the college's Office of Undergraduate Academic Affairs.
Registration

Students are personally responsible for correctly registering for courses and paying all tuition and fees by the official university registration and payment deadlines. Instructors do not have the authority to add students to courses. All students should verify the accuracy of their enrollment before the end of the add period.

Academic Load

Students should review the university policies regarding academic load in the Academic Policies section of this catalog.

In order to be considered for an overload, students must fulfill all of the following criteria:

- Be in good academic standing
- Have completed the prior semester with a GPA of 2.33 or higher
- Have a cumulative GPA of 2.33 or higher
- Have demonstrated in prior semesters at Mason the ability to handle an increased and demanding course load while maintaining high performance
- Have no remaining incompletes (INs) from a previous semester

Freshman and transfer students in their first semesters are not given permission for overloads as they have yet to establish an academic record at George Mason.

If approved for an overload, the student is responsible for adding the additional class(es) and paying for the related tuition by the official university deadlines.

Excluded Courses

Physical Education (PHED) and Parks, Recreation, and Leisure Studies (PRLS) activity courses cannot be used for credit for a degree in the College of Science.

MLSC 400 and MLSC 401 can be used for credit for a degree in the college, but credit from other MLSC courses may not be applied toward degrees in the college.

Once matriculated at Mason, students may not take CLEP exams and apply credits from those exams to degrees in the college. Students may apply credits from CLEP exams to degrees in the college only if those credits were awarded and reported prior to admission.

University Consortium Registration

Students should review the university policies regarding university consortium under Special Registration Procedure in the Academic Policies section of this catalog.

Students who have failed a course at Mason are not permitted to take the equivalent course through the consortium under any circumstances. All consortium registration requests must be submitted to the dean’s office at least 3 weeks prior to the first day of classes for the relevant semester at Mason.

Permission to Study Elsewhere

Students enrolled at George Mason University are expected to complete their coursework with George Mason courses. Exceptions to this policy are rare and are considered only under extraordinary circumstances, on a case-by-case basis. Students must obtain advance, written approval from their department/program and dean’s office before enrolling in classes elsewhere.
To be considered for an exception to this policy, students must have completed the immediately preceding semester with a GPA of 2.00 or higher and not be in danger of academic probation, suspension or dismissal. Freshmen and new transfer students are not allowed to take courses elsewhere as they have yet to establish an academic record at George Mason. Since transfer students have already transferred a number of hours, they are expected to plan all remaining courses at George Mason. Local community colleges are not part of the University Consortium, and requests to take community college courses can seldom be approved. Courses offered at Consortium Universities must be reviewed by the Consortium Coordinator in advance and do not need permission to study elsewhere.

Courses taken elsewhere that have been pre-approved by the dean’s office must be taken for a grade and be passed with a minimum grade of 2.00 or higher in order to be transferred to George Mason. Although credit for the course can be transferred, the grade for the course does not. The grade will not be factored into the student’s GPA. Additionally, approval to study elsewhere will not be granted after the student has completed the coursework. Approval for study elsewhere is specific to the term and course(s) for which it is granted. If a student does not complete the course(s) elsewhere during the approved term, the student must submit a new study elsewhere request to take the course(s) at a later date. Similarly, enrollment in additional or alternate courses at another institution will not be considered for transfer after the fact. Approval for study elsewhere during a given semester does not guarantee approval in a later term.

Students must make arrangements with the visited institution to have an official transcript mailed directly to the George Mason University Registrar’s Office immediately after the course work is completed. Credit cannot be transferred until an official transcript is received.

Additional information about study elsewhere can be found at www.gmu.edu/student/academicaffairs/policies.htm.

Study Abroad

In order to be considered for study through the Center for Global Education, students must plan well in advance and receive prior, written permission from the academic dean. Students must also meet all of the following criteria:

- Students must meet all eligibility criteria for their program as specified by the Center for Global Education, including minimum GPA requirements.
- Have completed the immediately preceding semester at Mason with a GPA of 2.00 or higher
- Have completed the necessary forms and have obtained all required signatures and course equivalencies

The Center for Global Education may have higher academic standards and students must meet all eligibility requirements.

Students in danger of probation, suspension, or dismissal should plan very carefully before requesting to study abroad. Students who are not in good academic standing will not be permitted to study abroad.

Withdrawals

Courses for which a withdrawal is approved receive a grade of "W".

Students are responsible for all courses in which they remain officially enrolled once the drop period has ended.

Instructors do not have the authority to withdraw students from classes. Withdrawals require the approval of the academic dean and are typically allowed only for full semesters at a time (all enrolled courses) and are only permitted for non-academic reasons. No withdrawals can be approved for academic reasons. When submitting a withdrawal request, students must provide verifiable, third-party documentation for the reason for the withdrawal. Requests for withdrawals should be submitted as early in the semester as possible, and never after the last day of classes.

Credits graded “W” do not affect a student’s GPA, but do count as attempted hours. The total attempted hours and cumulative GPA determine a student’s academic standing. If the cumulative GPA is below 2.00, withdrawals may affect whether a student will be on warning, probation, suspension, or dismissal. Students should be familiar with the Student Retention Categories in the Academic Policies section of the catalog.
Academic Clemency

Students should review the university policies regarding academic clemency under Academic Standing in the Academic Policies section of the catalog.

In extraordinary cases, students who (a) have been absent from George Mason for a minimum of three consecutive calendar years and (b) are currently in their first semester back at the university may request that their academic dean consider allowing clemency from up to 16 hours of coursework from previous semesters.

To be considered for this clemency, students must meet all of the following criteria:

- Be absent from George Mason for a minimum of three consecutive calendar years
- Provide a detailed explanation for why they were unsuccessful in those courses and how they have made changes to ensure their academic progress upon their return
- Submit their request within 12 months of the first day of the re-enrollment term
- In order to make this request, students should (a) enroll in at least 6 hours during their first 12 months back at George Mason and (b) earn a minimum GPA of 2.50 each semester back prior to making the clemency request, with no grade below 2.00. If these minimum academic requirements are not met during the first semester of return, then clemency will not be allowed under any circumstances.

Appeals Process

Students may appeal departmental decisions concerning academic actions to the Office of Undergraduate Academic Affairs. They may appeal decisions of the Office of Undergraduate Academic Affairs to the Dean's Council, a committee composed of college deans and faculty members. Students may appeal decisions of the Dean’s Council to the COS Associate Dean for Student and Academic Affairs. These levels of appeal are subject to the limits below concerning the final level of appeal for each type of academic action. Students who feel that the college appeal process was conducted unfairly may appeal to the Provost’s Office as specified in the Academic Policies chapter of this catalog.

Grade appeals should be made to the department or program, following the process specified in the Academic Policies chapter of this catalog. If they are resolved within the department or program, that unit is the final level of appeal. The departmental decision may be appealed to the dean only on the basis of procedural irregularity. Such appeals should be made through the Office of Undergraduate Academic Affairs. If the grade appeal is not resolved within the department or program, the chair makes a recommendation to the dean, who makes the final determination. The decision of the dean is not subject to review or further appeal.

Departments set the requirements for the majors and minors that they administer. Substitutions and waivers of requirements require the approval of the Office of Undergraduate Academic Affairs. When a department denies a substitution or waiver of a requirement, this decision may be appealed to the Office of Undergraduate Academic Affairs on the basis of procedural irregularity only, and it is the final level of approval.

The Dean’s Council is the final level of appeal for course overloads, consortium registration, study elsewhere, and withdrawals after the drop deadline within the semester.

The COS Associate Dean for Student and Academic Affairs is the final level of appeal for COS college level requirements, retroactive adds, withdrawals, graduation, and return from suspension and dismissal.

There is no waiver or appeal of satisfactory performance standards (minimum grades or grade point average, GPA) that have been set by the department or program faculty for the courses in their major or minor.

Students should file all appeals in a timely manner, usually within the semester in which the original decision is rendered, but no later than the final day of classes of the following semester.
Grievances

Grievances should be directed in writing to the Associate Dean for Student and Academic Affairs. The COS Undergraduate Academic Affairs Office may also provide guidance to students on how to resolve their concerns.

Transfer Students

Admitted and enrolled transfer students who have completed an AA, AS or AA&S degree from the Virginia Community College System (VCCS) and have been offered admission to Mason by the Office of Admissions may be eligible for a waiver of all George Mason University's lower level general education requirements in accordance with the Guaranteed Admission Agreement. Students eligible for this waiver are still required by the university to complete ENGH 302 and a synthesis course. Transfer students who have been offered admission under the terms of the Guaranteed Admission Agreement and are pursuing a degree in the college are considered to have met all college requirements except for proficiency in a foreign language (required of BA students).

Students with a bachelor's degree from an accredited institution who are pursuing a BA degree in COS are also considered to have met all college requirements except for proficiency in a foreign language.

Master's Level Certificate

Advanced Biomedical Sciences Graduate Certificate

Banner Code: SC-CERG-ABS

The Advanced Biomedical Sciences Graduate Certificate is a premium-priced program offered jointly by George Mason University and Georgetown University. This program is aimed at students who typically have all of their prerequisites for medical school but otherwise may have a modest science background (non-science majors, for example), or modest grades in the sciences as undergraduates, and/or may also need to improve their Medical College Admission Test scores. This is a 9-month full-time program that begins each fall semester. All classes are held at the Prince William Campus.

Applicants are expected to have a bachelor's degree from an accredited university, the desire to pursue a career in medicine or dentistry, completion of all of the prerequisite courses for medical school (biology, chemistry, organic chemistry, physics, math), and overall credentials suitable for acceptance to graduate programs in the College of Science at George Mason University and the Georgetown University Graduate School of Arts and Sciences.

This program of study is offered by the College of Science.

Certificate Requirements

Fall Semester (11 credits)

- BMED 601 - Cell and Molecular Physiology Credits: 4
- BMED 602 - Biostatistics and Epidemiology Credits: 3
- BMED 603 - Cell Biology and Microscopic Anatomy Credits: 3
• BMED 652 - Biomedical Career Pathways Credits: 1

Spring Semester (9 credits)

• BMED 604 - Fundamentals of Human Physiology Credits: 5
• BMED 605 - Introduction to Human Anatomy Credits: 3
• BMED 651 - Physician and Society Credits: 1

Total: 20 Credits

Joint Degree

Biomedical Sciences, MS

Banner Code: SC-MS-BMED

The MS degree in biomedical sciences is a one-year program offered jointly by George Mason University and Georgetown University, and graduates of the program will receive a diploma bearing the seals of both institutions. All associated courses will be offered at George Mason’s Prince William Campus. The Biomedical Sciences MS degree is intended for students who wish to be accepted into medical school, or who wish to pursue careers in biomedical research.

Students enrolled in the Biomedical Sciences MS program complete 34 credits of coursework, including 19 credits of medical courses, and 15 credits of graduate courses. The medical school courses are taught by faculty of the Georgetown University School of Medicine, and the graduate courses are taught by George Mason College of Science faculty. The program is built on the strength of Georgetown's medical program, combined with Mason’s expertise in the areas of systems biology, bioinformatics, and personalized medicine.

This program of study is offered by the College of Science.

Admission Requirements

Applicants to the Biomedical Sciences MS program should hold a BA or BS degree in biology, chemistry, physics, or a related field from an accredited university with a minimum GPA of 3.000, and they should have completed all of the prerequisite courses for admission to medical school (biology, chemistry, organic chemistry, physics, math). In addition to completing the GMU online graduate application package, applicants should include:

• A statement of desire to pursue a career in medicine, biomedical research, or a related field.
• Official score report for the MCAT or GRE-GEN exam.
• Three letters of recommendation.
• Two copies of official transcripts from each institution of higher learning attended.
• Virginia Domicile Classification form.
• Official TOEFL score report (for foreign nationals; minimum score of 230 on computer-based exam).
• Current resume.

Students enrolled in the MS program in biomedical sciences may not enroll concurrently in any other graduate degree program.

Degree Requirements

Candidates for the degree must successfully complete 34 credits in the categories shown below:

General Biology Courses (15 credits):

- BMED 610 - Principles of Systems Biology Credits: 2
- BMED 611 - Molecular Genetics Credits: 2
- BMED 612 - Principles of Gross Anatomy Credits: 1
- BMED 613 - Pathophysiology Credits: 3
- BMED 614 - Introduction to Neuroscience Credits: 3
- BMED 652 - Biomedical Career Pathways Credits: 1
- BMED 653 - Forum and Research Credits: 3

Medical Courses (19 credits):

- BMED 660 - Molecular and Cellular Physiology Credits: 3
- BMED 661 - Metabolism, Nutrition and Endocrinology Credits: 4
- BMED 662 - Cardiopulmonary Biology Credits: 1-5 (students enroll for 3 credits in the fall semester and 2 credits in the spring semester)
- BMED 663 - Gastrointestinal Biology Credits: 2
- BMED 664 - Renal Biology Credits: 2
- BMED 665 - Sexual Development and Reproduction Credits: 3

Total: 34 credits

Atmospheric, Oceanic and Earth Sciences

Phone: 703-993-6069
Web: aoes.gmu.edu

Faculty

Professors: Diecchio, Dirmeyer, Hazen (Robinson Professor), Kinter, Schneider, Schopf, Shukla, Straus (Chair), Summers"
**Associate professors:** Boybeyi, Chiu, DelSole, Houser**, Huang, Klinger, McBride

**Assistant professors:** Jin, Lu, Stan, Uhen

**Term professors:** Krishnamurthy

**Term associate professors:** Nord, Verardo

**Term assistant professors:** Kysar-Mattietti

**Term research faculty:** Doty

* Primary Affiliation in the School of Physics, Astronomy, and Computational Sciences

** Primary Affiliation in the Geography and Geoinformation Science Department

## Course Work

The department offers all course work designated CLIM and GEOL in the Courses chapter of this catalog.

## Honors Program for Earth Science and Geology

Earth science majors who have completed 16 credits of math and science, including GEOL 302, BIOL 308 or CLIM 301 with a GPA of 3.00 or higher are eligible to enter the departmental honors program. Transfer students who have an incoming GPA of 3.10 or higher in math and science and a B or better in GEOL 302 or BIOL 308 are also eligible. To graduate with honors in Earth Science students are required to maintain a minimum GPA of 3.00 in math and science and complete one of the two following sets of courses with an average GPA of 3.50 or better: (1) GEOL 410, 411 and 420 or (2) CLIM 408, 409 and GEOL 420.

## Undergraduate Degree

### Earth Science, BS

**Banner Code:** SC-BS-ESCI

This degree is intended for students interested in studying the earth and its environment. Recognizing that these are integrated disciplines, students receive a broad background in earth and environmental sciences and select one of six specialty concentrations. The concentrations in atmospheric science, earth science education, earth surface processes, environmental geoscience, and geology are solely offered by AOES. The concentration in oceanography and estuarine science is offered jointly with the Department of Environmental Science and Policy where specific advising is also available.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students must complete the following course work with a minimum GPA of 2.00. Through the course work below, Earth science majors satisfy the university and college requirements in natural science and quantitative reasoning. GEOL 317 fulfills the writing intensive requirement for this major.

This program of study is offered by the Department of Atmospheric, Oceanic and Earth Sciences in the College of Science .

## Degree Requirements
32-33 credits of core science and mathematics:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- GEOL 101 - Introductory Geology I Credits: 4
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- STAT 250 - Introductory Statistics I Credits: 3
- Choose one
  - GEOL 406 - Seminar in Earth and Environmental Science Credits: 3 or GEOL 420 - Earth Science and Policy Credits: 3
  and either
  - GEOL 309 - Introduction to Oceanography Credits: 3 or BIOL 309 - Introduction to Oceanography Credits: 3
  plus one of the following options:
    Option A
    - CLIM 111 - Introduction to the Fundamentals of Atmospheric Science Credits: 3
    - CLIM 112 - Introduction to the Fundamentals of Atmospheric Science Lab Credits: 1
    Option B
    - PHYS 111 - Introduction to the Fundamentals of Atmospheric Science Credits: 3
    - PHYS 112 - Introduction to the Fundamentals of Atmospheric Science Lab Credits: 1
    Option C
    - GGS 309 - Meteorology and Climate Credits: 3

8 credits of physics:

either the sequence
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
or the sequence
- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1
NOTE: Students in the Atmospheric Science Concentration must take the PHYS 160, 161, 260, 261 sequence.

Concentrations

Each student chooses a concentration in atmospheric science; earth science education; earth surface processes; environmental geoscience; geology; or oceanography and estuarine science. The credit requirements for each concentration differ as noted below.
▲ Atmospheric Science (ATMS)

This concentration gives students a strong quantitative undergraduate education in atmospheric and related sciences. The curriculum meets the American Meteorological Society's recommendations for a Bachelor's degree in atmospheric science and the US Government Civil Service GS -1340 qualification in meteorology. Students completing the atmospheric science concentration will be prepared for a wide range of career paths including operations and research (via graduate school) in meteorology, atmospheric science and climate. 41 credits are required as follows:

- CLIM 101 - Global Warming: Weather, Climate, and Society Credits: 3
- CS 112 - Introduction to Computer Programming Credits: 4
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3
- PHYS 262 - University Physics III Credits: 3
- CLIM 301 - Weather Analysis and Prediction Credits: 4
- GGS 314 or CLIM 314 - Severe and Extreme Weather Credits: 3
- PHYS 307 - Thermal Physics Credits: 3
- CLIM 408 - Senior Research Credits: 3

- CDS 401 - Scientific Data Mining Credits: 3
  or
- CSI 501 - Introduction to Scientific Programming Credits: 3

and 9 credits from the following:

- GGS 121 - Dynamic Atmosphere and Hydrosphere Credits: 4
- MATH 313 - Introduction to Applied Mathematics Credits: 3
- GGS 319 - Air Pollution Credits: 3
- GGS 353 - Observations of the Earth and its Climate Credits: 3
- CLIM 390 - Topics in Climate Research Credits: 1-4
- CLIM 409 - Research Internship Credits: 3
- CHEM 438 - Atmospheric Chemistry Credits: 3
- CLIM 411 - Introduction to Atmospheric Dynamics Credits: 3
- CLIM 412 - Physical Oceanography Credits: 3
- GGS 456 - Introduction to Atmospheric Radiation Credits: 3
- PHYS 475 - Atmospheric Physics Credits: 3

Total: 41 credits

▲ Earth Science Education (ESE)

This concentration is for students intending to pursue secondary school teaching in earth science. Students are advised from both the Geology program and the Graduate School of Education. 29 credits of course work are required, plus an additional 21 credits to satisfy the optional teaching licensure requirement:
• ASTR 111 - Introductory Astronomy: The Solar System Credits: 3
• ASTR 112 - Introductory Astronomy Lab: The Solar System Credits: 1
• GEOL 102 - Introductory Geology II Credits: 4
• GEOL 302 - Mineralogy Credits: 4
• GEOL 303 - Field Mapping Techniques Credits: 3
• GEOL 408 - Practicum for Geology Laboratories Credits: 1
• GEOL 409 - Practicum for Geology Laboratories Credits: 1

and three of the following:

* Requires C or better in GEOL 302

• EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
• GEOL 304 - Sedimentary Geology Credits: 4 *
• GEOL 308 - Igneous and Metamorphic Petrology Credits: 4 *
• GEOL 312 - Invertebrate Paleontology Credits: 4
• GEOL 317 - Geomorphology Credits: 4
• GEOL 363 - Coastal Morphology and Processes Credits: 4
• GEOL 401 - Structural Geology Credits: 4

Total: 29 credits

Optional Teacher Licensure Requirement (21 credits):

• EDUC 372 - Human Development, Learning, and Teaching Credits: 3
• EDUC 422 - Foundations of Secondary Education Credits: 3
• EDCI 473 - Teaching Science in the Secondary School Credits: 3
• EDCI 483 - Advanced Methods of Teaching Science in Secondary School Credits: 3
• EDCI 490 - Student Teaching in Education Credits: 6
• EDRD 419 - Literacy in the Content Areas Credits: 3

▲ Earth Surface Processes (EP)

This concentration focuses on a broad understanding of the physical processes and natural materials found at or near the earth's surface that have produced the primary landforms and landscapes observed today. Fundamental concepts, methods and techniques of landscape analysis are also examined. At least 31 credits are required as follows:

• GEOL 102 - Introductory Geology II Credits: 4
  or  
• EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4

• GEOL 302 - Mineralogy Credits: 4
• GEOL 303 - Field Mapping Techniques Credits: 3
• GEOL 306 - Soil Science Credits: 3

• GEOL 316 - Computers in Geology Credits: 3
or
• CS 112 - Introduction to Computer Programming Credits: 4 (Satisfies general education information technology requirement)

• GEOL 317 - Geomorphology Credits: 4

and four of the following:

* Requires C or better in GEOL 302

• GEOL 304 - Sedimentary Geology Credits: 4 *
• GEOL 305 - Environmental Geology Credits: 3
• GEOL 313 - Hydrogeology Credits: 3
• GEOL 315 - Topics in Geology II Credits: 1-3
• GEOL 363 - Coastal Morphology and Processes Credits: 4
• GEOL 401 - Structural Geology Credits: 4
• GEOL 403 - Geochemistry Credits: 3
• GEOL 417 - Geophysics Credits: 3

Total: 31-37 credits

▲ Environmental Geoscience (EVGS)

This concentration provides tools for applying geologic information (about soils, rocks, water, weather and landscapes) to contemporary environmental problems such as pollution and waste management, resource extraction, natural hazards, land-use and habitat restoration, species preservation, and human health. Environmental geoscience studies the physical environment in which biological interactions take place, and so aids in the understanding of ecology. At least 34 credits are required as follows:

• GEOL 102 - Introductory Geology II Credits: 4
• GEOL 302 - Mineralogy Credits: 4
• GEOL 305 - Environmental Geology Credits: 3
• GEOL 306 - Soil Science Credits: 3
• GEOL 313 - Hydrogeology Credits: 3
• GEOL 320 - Geology of Earth Resources Credits: 3
• GEOL 321 - Geology of Energy Resources Credits: 3

and one of the following:

• GEOL 403 - Geochemistry Credits: 3
• CHEM 427 - Aquatic Environmental Chemistry Credits: 3

and one of the following:

• EVPP 336 - Human Dimensions of the Environment Credits: 3
• EVPP 361 - Introduction to Environmental Policy Credits: 3

and two of the following:

• CLIM 101 - Global Warming: Weather, Climate, and Society Credits: 3
• CLIM 412 - Physical Oceanography Credits: 3
• CONF 101 - Conflict and Our World Credits: 3
• EVPP 201 - Environment and You: Issues for the Twenty-First Century Credits: 3
• EVPP 336 - Human Dimensions of the Environment Credits: 3
• EVPP 361 - Introduction to Environmental Policy Credits: 3
• EVPP 432 - Energy Policy Credits: 3
• EVPP 436 - The Human Dimensions of Global Climate Change Credits: 3
• GEOL 304 - Sedimentary Geology Credits: 4
• GGS 302 - Global Environmental Hazards Credits: 3
• GGS 311 - Introduction to Geographic Information Systems Credits: 3
• GGS 322 - Issues in Global Change Credits: 3
• NCLC 211 - Introduction to Conservation Studies Credits: 3-6
• NCLC 220 - Energy and Environment Credits: 3-6
• PHYS 331 - Fundamentals of Renewable Energy Credits: 3
• PRLS 300 - People with Nature Credits: 3
• PRLS 402 - Human Behavior in Natural Environments Credits: 3

Total: 35 credits (minimum)

▲ Geology (GEOL)

The Geology Concentration is fashioned after traditional geology bachelor's degrees. It allows graduates to be employed as geologists in the field or pursue graduate studies in geology. At least 31 credits are required.

* Requires C or better in GEOL 302

• GEOL 102 - Introductory Geology II Credits: 4
• GEOL 302 - Mineralogy Credits: 4
• GEOL 304 - Sedimentary Geology Credits: 4 *
• GEOL 308 - Igneous and Metamorphic Petrology Credits: 4 *
• GEOL 312 - Invertebrate Paleontology Credits: 4
• GEOL 317 - Geomorphology Credits: 4
• GEOL 401 - Structural Geology Credits: 4
• GEOL 404 - Geological Field Techniques Credits: 3-8  (Not offered regularly; 6-credit geology field camp is required as substitute. See advisor for details).

Total: 31 credits (minimum)

▲ Oceanography and Estuarine Science (OEST)

This concentration provides students with a comprehensive knowledge of oceanography. Additional coursework in physical and chemical oceanography give insight into the aquatic environment and its link to both ecosystems and climate. Within the concentration, students can choose an open ocean or coastal option. The curriculum will emphasize local and regional case studies, in particular the Chesapeake Bay. The program will provide students with the basic training required to allow them to obtain entry level positions in oceanographic and estuarine career tracks or an appropriate graduate degree program. At least 29 credits are required as follows:

• GEOL 102 - Introductory Geology II Credits: 4
• CLIM 412 - Physical Oceanography Credits: 3
  either
• GEOL 458 - Chemical Oceanography Credits: 3
  or
• CHEM 458 - Chemical Oceanography Credits: 3
  and one of the groups
• BIOL 103 - Introductory Biology I Credits: 4
• BIOL 104 - Introductory Biology II Credits: 4
  or
• BIOL 213 - Cell Structure and Function Credits: 4
• BIOL 303 - Animal Biology Credits: 4
  or
• EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
• EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4

One of the following two options:

**Open Ocean Option**

• GEOL 364 - Marine Geology Credits: 3
• BIOL 449 - Marine Ecology Credits: 3
• Elective from list below (3-4 credits)

**Coastal Ocean Option**

• GEOL 363 - Coastal Morphology and Processes Credits: 4
• EVPP 581 - Estuarine and Coastal Ecology Credits: 3
- EVPP 582 - Estuarine and Coastal Ecology Laboratory Credits: 1

Plus three additional credits or their equivalents, chosen from:

- BIOL 449 - Marine Ecology Credits: 3
- EVPP 581 - Estuarine and Coastal Ecology Credits: 3
- EVPP 582 - Estuarine and Coastal Ecology Laboratory Credits: 1
- BIOL 536 - Ichthyology Credits: 4
- EVPP 350 - Freshwater Ecosystems Credits: 4
- EVPP 377 - Applied Ecology Credits: 3
- EVPP 419 - Marine Mammal Biology and Conservation Credits: 3
- GEOL 302 - Mineralogy Credits: 4
- GEOL 304 - Sedimentary Geology Credits: 4
- GEOL 308 - Igneous and Metamorphic Petrology Credits: 4
- GEOL 312 - Invertebrate Paleontology Credits: 4
- GEOL 363 - Coastal Morphology and Processes Credits: 4
- NCLC 395 - Field-Based Work Credits: 1-18 (when topic is Exploring Underwater Ecology)
- BIOL 440 - Field Biology Credits: 1-4 (when topic is Coral Reef Ecology)
  Additional Recommended Course
- PHED 255 - Basic Scuba Diving Credits: 2

Total: 29 credits (minimum)

**Geology, BA**

**Banner Code**: SC-BA-GEOL

Students must fulfill all requirements for bachelor’s degrees, including university general education requirements. Students majoring in geology must complete additional college requirements for the BA degree in COS. Candidates for a degree in geology must also complete the following with a minimum GPA of 2.50 and through the course work below will satisfy the university wide requirements in natural science and quantitative reasoning. GEOL 317 fulfills the writing intensive requirement for this major.

This program of study is offered by the Department of Atmospheric, Oceanic and Earth Sciences in the College of Science.

**Degree Requirements**

**Geology Core (38 credits):**
- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4
- GEOL 302 - Mineralogy Credits: 4
- GEOL 304 - Sedimentary Geology Credits: 4 *
- GEOL 308 - Igneous and Metamorphic Petrology Credits: 4 *
- GEOL 312 - Invertebrate Paleontology Credits: 4
- GEOL 317 - Geomorphology Credits: 4
- GEOL 401 - Structural Geology Credits: 4
- GEOL 404 - Geological Field Techniques Credits: 3-8 **

Chemistry (8 credits):

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4

Mathematics (3-4 credits):

one of the following:

- MATH 110 - Introductory Probability Credits: 3
- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Computer Science (3-4 credits):

one of the following:

- CDS 130 - Computing for Scientists Credits: 3
- GEOL 316 - Computers in Geology Credits: 3
- CS 112 - Introduction to Computer Programming Credits: 4
- IT 103 - Introduction to Computing Credits: 3

Program Courses (9 credits):

9 credits of degree-related course work in a coherent program designed in coordination with advisor and approved by department chair

Notes:

* Students must achieve a grade of 2.00 or better in GEOL 302 before taking GEOL 304 or 308.

** 6 credits of GEOL 404, or a 6-credit geology field camp (see your advisor for details).
Total: 61-63 credits

Undergraduate Minor

Atmospheric Science Minor

Banner Code: ATMS

Topics include weather forecasting, climate change, and the predictability of coupled ocean-atmosphere-land-variations. Students in physics, math, engineering, and computational sciences may be attracted to this minor because it provides a compelling application of the fundamental methods of analysis learned in their major. Such students are ideal candidates for research in atmospheric science and climate dynamics and the minor will facilitate entry into graduate studies in these fields.

Students in Earth Science, Geography and Geoinformation Science, and Environmental Science may find this minor useful because the atmosphere is an important influence on geography, ecosystems, and geological strata, and plays an important role in global change. The minor is not open to students in the Atmospheric Sciences concentration of the Earth Science major.

Contacts: Dr. Nord and Dr. Boybeyi.

This program of study is offered by the Department of Atmospheric, Oceanic and Earth Sciences in the College of Science.

Course Work

Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

11 credits of Core Courses

- CLIM 101 - Global Warming: Weather, Climate, and Society Credits: 3
- CLIM 111 - Introduction to the Fundamentals of Atmospheric Science Credits: 3
- CLIM 112 - Introduction to the Fundamentals of Atmospheric Science Lab Credits: 1
- CLIM 301 - Weather Analysis and Prediction Credits: 4

6 credits of electives chosen from the following:

- CLIM 314 or GGS 314 - Severe and Extreme Weather Credits: 3
- CLIM 411 - Introduction to Atmospheric Dynamics Credits: 3
- CLIM 412 - Physical Oceanography Credits: 3
- CHEM 438 or CLIM 438 - Atmospheric Chemistry Credits: 3
- CLIM 408 - Senior Research Credits: 3
• PHYS 475 - Atmospheric Physics Credits: 3

Total: 17 credits

Earth Science Minor

Banner Code: ESCI

Students may not receive both the minor in geology and the minor in earth science. Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

This program of study is offered by the Department of Atmospheric, Oceanic and Earth Sciences in the College of Science.

Course Work

To receive this minor, students must successfully complete 18-19 credits with a minimum GPA of 2.00, distributed as follows:

• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 309 or BIOL 309 - Introduction to Oceanography Credits: 3
  and one of the following:
• CLIM 111 - Introduction to the Fundamentals of Atmospheric Science Credits: 3 and CLIM 112 - Introduction to the Fundamentals of Atmospheric Science Lab Credits: 1
  or
• GGS 309 - Meteorology and Climate Credits: 3

Electives

• 8 credits of geology electives

Total: 18-19 credits

Geology Minor

Banner Code: GEOL

This program of study is offered by the Department of Atmospheric, Oceanic and Earth Sciences in the College of Science.

For policies governing all minors, see the Academic Policies section of this catalog.

Course Work
To receive the minor, students must successfully complete 20 credits, 8 of which must be unique to the minor, with a minimum GPA of 2.00 to include:

- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4
- GEOL 302 - Mineralogy Credits: 4

Two of the following courses (8 credits):

- GEOL 304 - Sedimentary Geology Credits: 4 *
- GEOL 308 - Igneous and Metamorphic Petrology Credits: 4 *
- GEOL 312 - Invertebrate Paleontology Credits: 4
- GEOL 317 - Geomorphology Credits: 4
- GEOL 401 - Structural Geology Credits: 4

Notes:

* Students must achieve a grade of 2.00 or better in GEOL 302 before taking GEOL 304 or 308.

Total: 20 credits

Ocean and Estuarine Science Minor

Banner Code: OES

To receive this minor, students must successfully complete 18-22 credits, 8 of which must be unique to the minor, with a minimum GPA of 2.00.

For policies governing all minors, see the Academic Policies section of this catalog.

This program of study is offered by the Department of Atmospheric, Oceanic and Earth Sciences in the College of Science.

Course Work

Core Requirements (9-10 credits)

- GEOL 309 or BIOL 309 - Introduction to Oceanography Credits: 3
  and two of the following:
- CLIM 412 - Physical Oceanography Credits: 3
- GEOL 363 or EVPP 363 - Coastal Morphology and Processes Credits: 4
- BIOL 449 - Marine Ecology Credits: 3
at least three courses from the following: (9-12 credits)

Student may not repeat courses taken to satisfy the core requirement.

- BIOL 449 - Marine Ecology Credits: 3
- BIOL 450 or EVPP 421 - Marine Conservation Credits: 3
- BIOL 454 - Marine Mammal Biology and Conservation Credits: 3 and BIOL 455 Credits: 1*
  or
- EVPP 419 - Marine Mammal Biology and Conservation Credits: 3 and EVPP 420 Credits: 1*
- BIOL 536 or EVPP 536 - Ichthyology Credits: 4
- CLIM 101 - Global Warming: Weather, Climate, and Society Credits: 3
- CLIM 412 - Physical Oceanography Credits: 3
- EVPP 350 - Freshwater Ecosystems Credits: 4
- EVPP 581 - Estuarine and Coastal Ecology Credits: 3 *
- EVPP 582 - Estuarine and Coastal Ecology Laboratory Credits: 1 *
- GEOL 304 - Sedimentary Geology Credits: 4
- GEOL 308 - Igneous and Metamorphic Petrology Credits: 4
- GEOL 312 - Invertebrate Paleontology Credits: 4
- GEOL 363 or EVPP 363 - Coastal Morphology and Processes Credits: 4
- GEOL 364 - Marine Geology Credits: 3
- GEOL 458 or CHEM 458 - Chemical Oceanography Credits: 3
- BIOL 440 - Field Biology Credits: 1-4 (marine or estuarine oriented field courses only up to 4 credits)
- NCLC 495 - Field-Based Work Credits: 1-18 (marine or estuarine oriented field courses only up to 4 credits)

Notes:

PHED 255 is strongly recommended but not required.

*If chosen, must take both lecture and lab for a total of 4 credits

Total: 18-22 credits

Paleontology Minor

Banner Code: PLEO

This program of study is offered by the Department of Atmospheric, Oceanic and Earth Sciences in the College of Science.

For policies governing all minors, see the Academic Policies chapter of this catalog. To receive this minor, students must successfully complete 18-21 credits, 8 credits of which must be unique to the minor, with a minimum GPA of 2.00, distributed as follows:
Course Work

Required Core (12 credits)

- GEOL 102 - Introductory Geology II Credits: 4
- GEOL 312 - Invertebrate Paleontology Credits: 4
- GEOL 334 or BIOL 334 - Vertebrate Paleontology Credits: 4

Electives (6-9 credits chosen from the following)

NOTE: Many of the courses below have additional prerequisites beyond the required core courses above so please check the individual courses carefully.

Pick 2 courses from:

- GGS 321 or BIOL 374 - Biogeography: Space, Time, and Life Credits: 3
- BIOL 377 - Applied Ecology Credits: 3
- BIOL 470 - Dinosaur Biology Credits: 3
- BIOL 471 - Evolution Credits: 3
- BIOL 468 or EVPP 468 - Vertebrate Natural History Credits: 4
- GEOL 304 - Sedimentary Geology Credits: 4
- GEOL 364 - Marine Geology Credits: 3

OR choose one of the following four sequences

Option 1
- BIOL 310 - Biodiversity Credits: 5
  and
- BIOL 320 - Comparative Chordate Anatomy Credits: 4
  or
- BIOL 322 - Developmental Biology Credits: 4
  or
- BIOL 331 - Invertebrate Zoology Credits: 4
  or
- BIOL 332 - Insect Biology Credits: 4

Option 2
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
  and
- EVPP 468 or BIOL 468 - Vertebrate Natural History Credits: 4

Option 3
- GEOL 309 or BIOL 309 - Introduction to Oceanography Credits: 3
  and
- EVPP 419 - Marine Mammal Biology and Conservation Credits: 3
Option 4

- BIOL 305 - Biology of Microorganisms Credits: 3
  and
- BIOL 407 - Microbial Diversity Credits: 4

Total 18-21 credits

Doctoral Degree

Climate Dynamics, PhD

Banner Code: SC-PHD-CLIM

The mission of this program is to train the next generation of scientists in climate dynamics and related fields. Our students learn, through a comprehensive grounding in classwork, about how the atmosphere, ocean, and land surface work together to determine the climate. In collaboration with internationally-known scientists, students conduct independent work to further our understanding of climate, how it varies, and how much of it we can predict. Tools in the program include cutting-edge climate models, superb computing facilities, sophisticated statistical techniques, and comprehensive data sets. Our graduates have gone on to work at top laboratories and universities.

Understanding climate variability and predictability poses difficult mathematical, computational, and observational questions that have generated increasing intellectual excitement in recent years. Climate variability has important ramifications for society, from planning for next year’s electrical demand and forecasting agricultural production to answering complex questions involving long-term change in global climate, sea level, and biodiversity. While it is impossible to predict day-to-day weather more than a few weeks in advance, progress in predicting El Niño supports the idea that seasonal averages of temperature, rainfall, and other factors may be at least partly predictable months or even years in advance. Likewise, there is a strong scientific basis for predicting long-term changes in global climate due to changing greenhouse gas concentrations.

Climate dynamics faculty members have a blend of expertise in dynamics, statistics, and computational methods. They are heavily involved with national and international collaborations. Faculty members and students work closely with scientists at the Center for Ocean-Land-Atmosphere Studies (COLA), a national leader in climate modeling.

Faculty research focuses on the areas of climate prediction and predictability, climate variability, coupled ocean-atmosphere-land dynamics, and dynamical systems and retrospective analysis. Recent research topics include predictability of weather and climate; modeling of the complex climate system; El Niño dynamics; monsoons; atmosphere-ocean interaction; land-climate interaction; decadal climate variability; ocean circulation theory; and climate change.

This program of study is offered by the Department of Atmospheric, Oceanic and Earth Sciences in the College of Science.

Admission Requirements

Applicants should have demonstrated high aptitude for quantitative reasoning, applied mathematics, and physical science. Applicants should have an undergraduate degree from an accredited institution, with a GPA of at least 3.00 in undergraduate work and a combined GRE score of 1,100 (verbal plus quantitative). To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, a current résumé, and an expanded goals statement to the COS Fairfax Campus Graduate Admissions Processing Center. Applicants should also include three letters of recommendation and an official report of scores obtained on the GRE-GEN. The GRE
requirement for admission to the doctoral programs will be waived if the student holds a master’s degree from a U.S. institution. TOEFL scores are required of all international applicants who have not completed an MS degree in the United States.

**Reduction of Credit**

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

**Degree Requirements**

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

The program requires 72 credits beyond the baccalaureate degree, with a minimum of 48 credits in course work, and 24 credits of dissertation research. For those holding master’s degrees, the required 48 credits may be reduced by up to 30 credits, depending on graduate courses completed. The degree will be awarded on completion of the required course work and approval of a PhD thesis that makes an original and significant contribution to the field.

The 48-credit curriculum requirement is divided into four areas: 12 credits of fundamental climate science courses, 9 credits of core computational methods, 3 credits of seminar, and a minimum of 24 credits of electives. The course work is organized as follows:

**Doctoral Course Work (24 credits)**

**Fundamental Climate Science Courses (12 credits):**

- CLIM 710 - Introduction to Physical Climate System Credits: 3
- CLIM 711 - Introduction to Atmospheric Dynamics Credits: 3
- CLIM 712 - Physical and Dynamical Oceanography Credits: 3
- CLIM 714 - Land-Climate Interactions Credits: 3

**Core Computational Courses (9 credits):**

- CSI 700 - Numerical Methods Credits: 3
- CSI 701 - Foundations of Computational Science Credits: 3
- CLIM 715 - Numerical Methods for Climate Modeling Credits: 3

**Climate Seminar (3 credits):**
• CLIM 991 - Climate Dynamics Seminar Credits: 1 (taken three times)

Electives (24 credits):
• 24 credits of electives, including up to 5 credits of independent research

Qualifying Exams

After completing the fundamental climate science courses, students take a two-part qualifying exam that includes core and specialty components. The core component is administered by an examination committee. After successfully completing the core component exam, students take the exam for the specialty component, which is administered by the dissertation committee that students typically form by the spring semester of their second year.

Advancement to Candidacy

Following successful completion of both parts of the qualifying exam, students present a written dissertation proposal to the committee. Students may enroll in CLIM 998 Doctoral Dissertation Proposal to complete this effort. After approval of the dissertation proposal, students are formally advanced to doctoral candidacy.

Dissertation Research (24 credits):

No more than 24 combined credits from CLIM 998 and CLIM 999 may be applied toward satisfying doctoral degree requirements, with no more than 12 credits of CLIM 998.

• CLIM 998 - Doctoral Dissertation Proposal Credits: 1-12
• CLIM 999 - Doctoral Dissertation Credits: 1-12 (minimum 3 credits)

Dissertation Research and Defense

After approval of the dissertation proposal, students are formally advanced to doctoral candidacy and produce the dissertation while taking CLIM 999. The degree will be awarded on completion of the required course work and approval of a dissertation that makes an original and significant contribution to the field.

Total: 72 credits

Biology Undergraduate Program

Phone: 703-993-1050
Web: biology.gmu.edu

Faculty

Director: Rockwood
Assistant Director: Otto

Biology Undergraduate Coordinator: Polayes

Medical Technology Coordinator: Peters

Professors: Rockwood

Term associate professors: Kocache, Polayes

Term assistant professors: Castilla, Fondufe, Laemmerzahl, Luther, Madden, Otto, Tondi, Verhoeven

Adjunct faculty: Amer, Einhorn, Jones, McClintock, Verardo, Wood-Salvesen

The Biology Undergraduate Program is a collaboration between the School of Systems Biology and the Department of Environmental Science and Policy (ESP). In addition, the Program has its own dedicated teaching faculty. The Program is administered by the Biology Program Director and the Assistant Program Director. It is governed by a Biology Program Committee consisting of the Program Director, two Biology Program faculty, two faculty from the School of Systems Biology and two faculty from the ESP Department.

Course Work

The program offers all undergraduate course work designated BIOL and MTCH in the Courses chapter of this catalog.

Undergraduate Degree Programs

The bachelor degree programs in biology provide a sound liberal arts education with substantial experience in quantitative and analytical thought, along with preparation for a related profession. In addition to ensuring the strong background necessary for graduate study in the many fields of biological science, the broad range of courses available at Mason allows students to develop careers in many areas, including secondary school teaching, environmental management, microbiology, molecular biology, biotechnology, genetics, and natural history. Alternatively, students may prepare for postgraduate studies in medicine, dentistry, veterinary medicine, wildlife management, fisheries biology, or marine science. The program also offers a BS in medical technology. Additional information can be found at the Biology Program’s web site at biology.gmu.edu or by visiting the Biology Program office in David J. King Hall, Room 3005.

Advising

All biology majors are strongly urged to see an academic advisor regularly to help them plan their schedule, so they can graduate on time. Biology majors should see an advisor for permission to register prior to their first semester and again as they complete 60 credits and 90 credits. Medical technology majors must see the medical technology advisor to obtain permission to register each semester.

Students returning from suspension are required to meet with the Undergraduate Coordinator or designee prior to being allowed to register.

For more information on advising or to set up an appointment, go to http://biology.gmu.edu.

Residence Requirement for Transfer Students

Students majoring in biology are required to complete 16 credits in the major at the 300 and 400 levels at Mason in addition to meeting the university residency requirement of at least 30 credits at Mason.
Policy on Using Biology Program Laboratories

Only authorized experiments and exercises may be carried out in any program research or teaching laboratory and must be done under the supervision of a university faculty or staff member. No unauthorized work is allowed in any laboratory.

Policy on Using Organisms in Classes

Direct observations of actual organisms are considered an essential part of learning biology at all levels. Direct observations of organisms may involve the use of living or preserved specimens, dissections of organisms or parts of organisms, and microscopic examination of organisms or parts of organisms. All use of live animals conforms to National Institutes of Health guidelines for the use and care of laboratory animals. Activities specified above may be a required part of a course and thus serve as a basis for grading in the course. Any questions about the administration of this policy should be directed to the course coordinator or instructor.

Honors Program in Biology

Admission Requirements

Minimum requirements for invitation:

- GPA in biology courses must be 3.33 or better
- GPA in supporting requirements (math and other science) must be 3.33 or better
- Grade of B or better in BIOL 213

Students should apply for admission to the Honors Program during their first or second year at the university.

Retention Requirements

Students in honors biology must maintain a biology GPA of 3.33 or better and a supporting GPA of 3.33 or better from the time they have accumulated 30 hours and thereafter. Students who fall below this standard will be given a one semester probationary period in which to bring their GPA back up to the minimum standard.

Requirements to Graduate with Biology Honors

Students are required to take 6 to 8 credits in honors courses in BIOL including three semesters of BIOL 494 (honors seminar, 1 credit) or two semesters of BIOL 494 and one semester of BIOL 493 (honors research, 1 credit). The GPA requirements are as follows:

- Minimum 3.33 GPA in honors biology courses
- Minimum 3.33 GPA in biology requirements
- Minimum 3.33 GPA in supporting requirements
- Minimum 3.33 GPA overall

Writing-Intensive Requirement

Mason requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in biology fulfill this requirement by successfully completing BIOL 308. Medical Technology majors fulfill the requirement by completing BIOL 453.
Minor in Biology

Candidates for the minor in biology must complete 19-21 credits in Biology with a minimum GPA of 2.00 including BIOL 213 and BIOL 311, either 308 or 310 and two elective courses in biology. A grade of C or better must be earned in BIOL 213 before a student can advance to Upper Division courses. Note: Eight credits of coursework must be unique to the minor. For policies concerning minors, see the Academic Policies chapter of this catalog.

Premedical, Predental, Prepharmacy, and Preveterinary Students

Web: prehealth.gmu.edu
Many students planning to enter medical, dental, pharmacy, veterinary, optometry, or other health professional schools choose to pursue a major in biology. These students should consult the health professions advising web site on required course work and overall preparation.

Teacher Licensure

Students who wish to become teachers should pursue either the BA in Biology with a Concentration in Education or the BS in Biology with a Concentration in Education and consult the College of Education and Human Development chapter of this catalog and attend an information session early in their undergraduate career. For more information, call 703-993-2892, e-mail gseadmit@gmu.edu, or go to gse.gmu.edu.

Biology for Nonmajors

Students who are not majoring in science or mathematics and wish to fulfill their natural science requirement may enroll in BIOL 103 and 104. With permission of the instructor, nonmajors may enroll in BIOL 213 for further study. Chemistry, physics, and mathematics majors should consult their faculty advisor to determine which biology courses to take.

BS in Medical Technology

This program requires the equivalent of three years of full time professional study at the college level preceding a senior year of professional education in an affiliated school of medical technology. All affiliated schools are accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

Responsibility for applying to schools of medical technology and gaining admission rests with the student; however, guidance is provided by the medical technology program director. Admission to medical technology schools is selective, so candidates should strive for strong academic standing. Students who fail to gain admission to a NAACLS-approved school are unable to complete the degree program. Such students may transfer to the biology major without loss of credits.

Application to medical technology schools should be initiated about a year before the desired entrance date. This fact, coupled with the large number of required courses in the pre-professional curriculum, makes it imperative that students in the program consult regularly with their faculty advisor. All medical technology majors and prospective majors are urged to enroll in MTCH 200 as early as possible. This course provides information on the profession, as well as the educational demands placed on candidates.

Students should be aware that the senior year spent off campus requires the following special interpretation of university policies. Transfer students must present at least 16 credits of 300-400 level biology or chemistry coursework taken at Mason. Students may present no more than 6 credits of D grades in biology and chemistry courses required in three years of pre-professional study. No unsatisfactory grades may be presented for courses in the senior year of professional study. Transfer students entering with more than 45 transfer credits are often unable to complete the pre-professional phase of their program in the usual three years of full-time study.
Senior students are registered at the university through special procedures. For details, consult the program director.

In addition to satisfying university general education requirements for the BS degree and completing MTCH 200, candidates must present all courses in their pre-professional programs with a minimum GPA of 2.00. Students must earn a C or better in core BIOL courses and must earn a C or better in BIOL 213 in order to advance in the major. Because of the extensive professional education requirements stipulated by NAACLS, students majoring in medical technology are exempt from the university-wide general education requirement in the fine arts.

**Major in Medical Technology as a Second Bachelor’s Degree**

While the standard program for medical technologists is three years on campus followed by a fourth year at a clinical affiliate (3 + 1), many students elect to complete a bachelor’s degree before entering the clinical program (4 + 1). Students who have completed a BS in biology or chemistry at Mason and then undertake a fifth year at a clinical affiliate may be eligible for a second bachelor’s degree with a major in medical technology. Students wishing to receive the second degree must apply before entering their fifth year. For further information, contact a medical technology advisor.

**Premedical Honor Society**

Alpha Epsilon Delta Zeta Premedical Honor Society is a national student support group, providing professional school tours, educational programs, and lectures on health topics and the professional school admissions process to students interested in such health-related fields as medicine, dentistry, optometry, and veterinary medicine. Active membership is awarded to students who have completed at least three semesters with a minimum scholastic GPA of 3.00. Associate membership is also available.

**Predental Society**

Mason students who are interested in pursuing careers in dentistry are encouraged to participate in the Predental Society. This student organization organizes supplemental programming focused toward dentistry as a career.

**Biology, Bachelor's/Accelerated Master's Degree**

Qualified undergraduates may be admitted to an accelerated master’s program and obtain both a BS and an MS within an accelerated time frame. This program is open only to those students who wish to pursue the master’s degree concentrations in microbiology or molecular biology. Students admitted to this program may take graduate courses after completing 90 undergraduate credits, and up to 6 credits of graduate work may be used in partial satisfaction of the requirements for the undergraduate degree. If students earn at least a 3.00 in these classes, they are granted advanced standing in the master’s program and must then complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met, including a minimum of 18 credits taken for the master’s after the bachelor’s degree is complete.

Students with an overall GPA of at least 3.00 may apply for provisional acceptance to the accelerated master’s program after completing BIOL 213, 214, 308, 310 and 311; and CHEM 315 and 318; Three letters of recommendation, including one from a prospective thesis or project advisor, are required.

After completing 120 credits and all requirements for the bachelor’s degree, students are awarded a bachelor's degree. Accelerated master’s students must then submit scores on the GRE and biology subject exam to have the provisional qualifier removed. Ordinarily, students should receive a minimum combined score of 1,100 on the verbal and quantitative portions of the general test and be in at least the 50th percentile on the subject exam.

**Undergraduate Degree**
Biology, BA

Banner Code: SC-BA-BIOL

This program of study is offered by the College of Science.

Students must fulfill all requirements for bachelor’s degrees, including university general education requirements. Students majoring in biology must complete additional college requirements for the BA degree in COS. Students must complete the requirements with a minimum GPA of 2.00 in the 32 credits of BIOL courses and a minimum GPA of 2.00 in the supporting courses listed below.

Additionally:

- Students may apply no more than 4 credits of BIOL 103 or 104 toward elective credit (or equivalent transfer credit at the 100-200 level) if taken before successful completion of BIOL 213.
- Biology majors must earn a minimum grade of C in all biology core courses listed below. A grade of C or better must be earned in BIOL 213 in order to advance to other core requirements.
- Students may repeat BIOL 213 once and a second time only with permission of the Biology Undergraduate Program.
- Students may not count BIOL 124 and BIOL 125 toward any Biology major requirements.
- Students who take BIOL 310 may not count BIOL 303 and/or BIOL 304 toward any Biology major requirements.
- BIOL 308 fulfills the writing intensive requirement for this major.

Through the course work below, biology majors satisfy the university-wide requirements in natural science, quantitative reasoning, and information technology proficiency.

Degree Requirements

22 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5

10 credits of biology electives:

- 10 credits of biology electives; six of these credits must be upper division and one of these upper division courses must include a laboratory

8 credits of chemistry:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
3-4 credits of math chosen from:

- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

3 credits of computer science

- CDS 130 - Computing for Scientists Credits: 3 (recommended by the biology program)
- or any course that fulfills the IT general education requirement

6 credits chosen from:

- ASTR 103 - Astronomy Credits: 3
- ASTR 111 - Introductory Astronomy: The Solar System Credits: 3
- ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3
- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4
- PHYS 243 - College Physics Credits: 3
- PHYS 245 - College Physics Credits: 3
- PHYS 160 - University Physics I Credits: 3
- PHYS 260 - University Physics II Credits: 3

Note:

Students expecting to enter graduate or professional school are strongly urged to complete MATH 113 and 114. Organic chemistry and PHYS 243, 244, 245, and 246 are recommended.

Concentration

Students may choose to complete the major requirements for the Biology, BA through the course work expressed above, or, if their goal is to become licensed to teach biology in Virginia secondary schools, through following the curriculum shown below. Students who choose to complete the concentration must complete their course work with a minimum GPA of 2.00 in the BIOL courses presented for the major and a minimum GPA of 2.00 in the supporting requirements presented for the major. No more than 4 credits of 100-level BIOL courses (103 or 104) may be applied toward the 32 credits of required BIOL courses. Biology majors in the concentration must earn a minimum of C in all biology core courses listed below.

▲ Concentration in Biology Education (with Licensure) (BIED)
The education concentration consists of a selection of courses that provide essential skills to students who wish to pursue a career teaching high school biology. The concentration allows students to receive a license to teach biology in Virginia secondary schools within 120 credits.

Students must fulfill all requirements for a bachelor's degree. In addition to satisfying the university-wide general education requirements and the requirements for a BA degree in COS, students majoring in biology with a concentration in education with licensure must complete the following course work. In doing so, students satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.

22 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5

8 credits of anatomy and physiology courses:

- BIOL 430 - Advanced Human Anatomy and Physiology I Credits: 4
- BIOL 431 - Advanced Human Anatomy and Physiology II Credits: 4

3 credits of biology electives:

- One additional biology elective

8 credits of chemistry:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4

3-4 credits of math chosen from:

- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

3 credits of computer science
- CDS 130 - Computing for Scientists Credits: 3 (recommended by the biology program)
- or any course that fulfills the IT general education requirement

6-7 credits chosen from:

- ASTR 103 - Astronomy Credits: 3
- ASTR 111 - Introductory Astronomy: The Solar System Credits: 3
- ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3
- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4
- PHYS 243 - College Physics Credits: 3
- PHYS 245 - College Physics Credits: 3
- PHYS 160 - University Physics I Credits: 3
- PHYS 260 - University Physics II Credits: 3

Teacher Licensure Requirement (21 credits):

- EDCI 473 - Teaching Science in the Secondary School Credits: 3
- EDCI 483 - Advanced Methods of Teaching Science in Secondary School Credits: 3
- EDUC 372 - Human Development, Learning, and Teaching Credits: 3 (Fulfills university-wide general education requirement for social and behavioral sciences)
- EDUC 422 - Foundations of Secondary Education Credits: 3
- EDCI 490 - Student Teaching in Education Credits: 6 (Fulfills university-wide general education requirement for synthesis)
- EDRD 419 - Literacy in the Content Areas Credits: 3

Biology, BS

Banner Code: SC-BS-BIOL

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. Students must complete their biology coursework and the supporting requirements below with a minimum GPA of 2.00.

Additionally:

- Students may apply no more than 8 credits of BIOL 103 or 104 toward elective credit (or equivalent transfer credit at the 100-200 level) if taken before successful completion of BIOL 213.
- Biology majors must earn a minimum grade of C in all biology core courses listed below. A grade of C or better must be earned in BIOL 213 in order to advance to other core requirements.
- Students may repeat BIOL 213 once and a second time only with permission of the Biology Undergraduate Program.
- Students may not count BIOL 124 and/or BIOL 125 toward any Biology major requirement.
• Students who take BIOL 310 may not count BIOL 303 and/or BIOL 304 toward any Biology major requirement.

• BIOL 308 meets the writing intensive requirement for this major.

Several optional concentrations are available (see below). Through the course work below, biology majors satisfy the university-wide requirements in natural science, quantitative reasoning, and information technology proficiency.

This program of study is offered by the Biology Undergraduate Program in the College of Science.

Degree Requirements

Students who do not select an optional concentration complete the curriculum requirements listed below.

22 credits of biology core courses:

• BIOL 213 - Cell Structure and Function Credits: 4
• BIOL 214 - Biostatistics for Biology Majors Credits: 4
• BIOL 311 - General Genetics Credits: 4
• BIOL 308 - Foundations of Ecology and Evolution Credits: 5
• BIOL 310 - Biodiversity Credits: 5

22 credits of biology electives:

• 22 credits of additional biology courses of which at least 14 credits must be upper division and two of the upper division courses must include a laboratory.

13 credits of chemistry:

• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CHEM 313 - Organic Chemistry Credits: 3
• CHEM 315 - Organic Chemistry Lab I Credits: 2

One of the following options (3-8 credits):

Students are encouraged to consult with a biology faculty advisor to determine which option (A, B or C) best meets their career goals.

Option A
• CHEM 314 - Organic Chemistry Credits: 3
• CHEM 318 - Organic Chemistry Lab II Credits: 2

Option B
• One chemistry course at the 300 or 400 level (3) (not CHEM 314)

Option C
• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 102 - Introductory Geology II Credits: 4
8 credits of physics:

One sequence chosen from:

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1

The following physics course sequence will also satisfy the biology major requirement

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

3-4 credits of math chosen from:

- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

3 credits of computer science:

- CDS 130 - Computing for Scientists Credits: 3 (recommended by the biology program)
- or any course that fulfills the IT general education requirement

Note:

Students expecting to enter a professional school are strongly urged to complete MATH 113 and 114. Students who wish to take biochemistry must take BIOL 483 to receive credit toward the major in biology.

▲ Concentration in Biology Education (with Licensure) (BIED)

The education concentration consists of a selection of courses that provide essential skills to students who wish to pursue a career teaching high school biology. The concentration allows students to receive a license to teach biology in Virginia secondary schools within 120 credits.

Through the course work below, students satisfy the university-wide general education requirements in social and behavioral science, natural science, quantitative reasoning, information technology proficiency and synthesis. Students who choose to undertake this concentration must complete their biology course work and the supporting requirements with a minimum GPA of 2.00 and fulfill all requirements for bachelor's degrees including university general education requirements and the additional rules for the BS in biology listed above.
22 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5

8 credits of anatomy and physiology

- BIOL 430 - Advanced Human Anatomy and Physiology I Credits: 4
- BIOL 431 - Advanced Human Anatomy and Physiology II Credits: 4

8 credits of biology electives:

- 8 credits of additional biology courses. BIOL 124 and 125 are not eligible to fulfill this requirement.

13 credits of chemistry:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2

One of the following options (3-8 credits):

Students are encouraged to consult with a biology faculty advisor to determine which option (A, B, or C) best meets their career goals.

Option A
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 318 - Organic Chemistry Lab II Credits: 2

Option B
- One chemistry course at the 300 or 400 level (not CHEM 314)

Option C
- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4

8 credits of physics:
One sequence chosen from:

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1

The following physics course sequence will also satisfy the biology major requirement

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

3-4 credits of math chosen from:

- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

3 credits of computer science:

- CDS 130 - Computing for Scientists Credits: 3 (recommended by the biology program)
- or any course that fulfills the IT general education requirement

Teacher Licensure Requirement (21 credits):

EDCI 473 and EDCI 483 will count towards the 44 required hours in biology

- EDCI 473 - Teaching Science in the Secondary School Credits: 3
- EDCI 483 - Advanced Methods of Teaching Science in Secondary School Credits: 3
- EDUC 372 - Human Development, Learning, and Teaching Credits: 3 (Fulfills university general education requirement for social and behavioral science)
- EDUC 422 - Foundations of Secondary Education Credits: 3
- EDCI 490 - Student Teaching in Education Credits: 6 (Fulfills university general education requirement for synthesis)
- EDRD 419 - Literacy in the Content Areas Credits: 3

▲ Concentration in Biotechnology and Molecular Biology (BTMB)

The biotechnology and molecular biology concentration consists of a selection of courses that provide essential skills to students who seek employment in the field or wish to include an applied component in their undergraduate training in biology.

Students who choose to undertake this concentration must complete their biology course work and the supporting requirements with a minimum GPA of 2.00 and fulfill all requirements for bachelor's degrees including university general education
requirements and the additional rules for the BS in biology listed above. Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.

22 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5

11 credits of biotechnology courses:

- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 385 - Biotechnology and Genetic Engineering Credits: 3
- BIOL 483 - General Biochemistry Credits: 4

11 credits chosen from:

Note: Laboratories associated with these courses are required. At least one of these electives must include a laboratory.

- BIOL 402 - Applied and Industrial Microbiology Credits: 3
- BIOL 403 - Techniques in Applied and Industrial Microbiology Credits: 1 *
- BIOL 405 - Microbial Genetics Credits: 4
- BIOL 406 - Microbial Physiology and Metabolism Credits: 4
- BIOL 411 - Advanced General Genetics Credits: 3
- BIOL 417 - Selected Topics in Molecular and Cellular Biology Credits: 1-4 **
- BIOL 418 - Current Topics in Microbiology Credits: 3 **
- BIOL 420 - Vaccines Credits: 3
- BIOL 421 - Genetics of Human Diseases Credits: 3
- BIOL 422 - Stem Cell Biology and Regenerative Medicine Credits: 3
- BIOL 452 - Immunology Credits: 3
- BIOL 453 - Immunology Laboratory Credits: 1 *
- BIOL 482 - Introduction to Molecular Genetics Credits: 3
- BIOL 484 - Eukaryotic Cell Biology Credits: 3
- BIOL 486 - Molecular Biology and Biotechnology Laboratory Credits: 2
- BIOL 497 - Special Problems in Biology Credits: 1-4 **

Notes:
*BIOL 403 must be taken with BIOL 402 and BIOL 453 must be taken with BIOL 452.

**Registration for BIOL 417, 418 or 497 subject to approval by program coordinator.

18 credits of chemistry:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 318 - Organic Chemistry Lab II Credits: 2

8 credits of physics:

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1
  The following Physics courses will also satisfy the Biology major requirement
  - PHYS 160 - University Physics I Credits: 3
  - PHYS 161 - University Physics I Laboratory Credits: 1
  - PHYS 260 - University Physics II Credits: 3
  - PHYS 261 - University Physics II Laboratory Credits: 1

3-4 credits of math chosen from:

- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

3 credits of computer science:

- CDS 130 - Computing for Scientists Credits: 3 (recommended by the biology program)
- or any course that fulfills the IT general education requirement

▲ Concentration in Environmental and Conservation Biology (ESCB)
This concentration is offered to students seeking a biology degree that focuses on ecology and organismal biology and prepares them for graduate work or employment in environmental and conservation fields, such as natural resources management, fisheries, forestry, water quality management, aquatic and wetland ecology, and conservation biology. The concentration is staffed and supported by the Department of Environmental Science and Policy.

Students who choose to undertake this concentration must complete their biology course work and the supporting requirements with a minimum GPA of 2.00 and fulfill all requirements for bachelor's degrees including university general education requirements and the additional rules for the BS in biology listed above. Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.

22 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5

6 credits in environmental and conservation biology

- BIOL 318 - Conservation Biology Credits: 3
- BIOL 377 - Applied Ecology Credits: 3

3-4 credits in field biology chosen from:

- BIOL 345 - Plant Ecology Credits: 4
- BIOL 350 - Freshwater Ecosystems Credits: 4
- BIOL 468 - Vertebrate Natural History Credits: 4
- One 3-4 credit field course approved by the Biology Program Director

12-13 credits of biology electives chosen from:

Two courses must be selected from the list below, and one of these courses must include a laboratory.

- BIOL 309 - Introduction to Oceanography Credits: 3
- BIOL 326 - Animal Physiology Credits: 3
- BIOL 331 - Invertebrate Zoology Credits: 4
- BIOL 332 - Insect Biology Credits: 4
- BIOL 344 - Plant Diversity and Evolution Credits: 4
- BIOL 345 - Plant Ecology Credits: 4 *
• BIOL 350 - Freshwater Ecosystems Credits: 4 *
• BIOL 355 - Ecological Engineering and Ecosystem Restoration Credits: 4
• BIOL 440 - Field Biology Credits: 1-4
• BIOL 449 - Marine Ecology Credits: 3
• BIOL 454 - Marine Mammal Biology and Conservation Credits: 3
• BIOL 455 - Marine Mammal Biology and Conservation Field Course Credits: 1
• BIOL 459 - Fungi and Ecosystems Credits: 3
• BIOL 468 - Vertebrate Natural History Credits: 4 *
• BIOL 472 - Introductory Animal Behavior Credits: 3
• BIOL 473 - Introductory Laboratory in Animal Behavior Credits: 1

Note:
*If not used for field course requirement.

13 credits of chemistry:

• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CHEM 313 - Organic Chemistry Credits: 3
• CHEM 315 - Organic Chemistry Lab I Credits: 2

One of the following options (3-8 credits):

• One chemistry course at the 300 or 400 level (not CHEM 314)  
  Option A
• CHEM 314 - Organic Chemistry Credits: 3
  and
• CHEM 318 - Organic Chemistry Lab II Credits: 2  
  Option B
• One chemistry course at the 300 or 400 level (not CHEM 314)  
  Option C
• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 102 - Introductory Geology II Credits: 4

8 credits of physics:

One sequence chosen from:

• PHYS 243 - College Physics Credits: 3
• PHYS 244 - College Physics Lab Credits: 1
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1
The following physics course sequence will also satisfy the biology major requirement

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

3-4 credits of math chosen from:

- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

3 credits of computer science:

- CDS 130 - Computing for Scientists Credits: 3 (recommended by the biology program)
- or any course that fulfills the IT general education requirement

▲ Concentration in Marine and Freshwater Biology (MFWB)

This concentration is offered to students seeking a biology degree that focuses on the biology of organisms in marine and freshwater environments.

Students who choose to undertake this concentration must complete their biology course work and the supporting requirements with a minimum GPA of 2.00 and fulfill all requirements for bachelor's degrees including university general education requirements and the additional rules for the BS in biology listed above. Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.

22 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5

10 credits of marine and freshwater courses:
• BIOL 309 - Introduction to Oceanography Credits: 3
• BIOL 350 - Freshwater Ecosystems Credits: 4
• BIOL 449 - Marine Ecology Credits: 3

12 credits of biology electives chosen from:

• BIOL 331 - Invertebrate Zoology Credits: 4
• BIOL 440 - Field Biology Credits: 1-4
• BIOL 450 - Marine conservation Credits: 3
• BIOL 454 - Marine Mammal Biology and Conservation Credits: 3
• BIOL 455 - Marine Mammal Biology and Conservation Field Course Credits: 1
• BIOL 472 - Introductory Animal Behavior Credits: 3
• BIOL 473 - Introductory Laboratory in Animal Behavior Credits: 1

33 credits of physical sciences:

• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CHEM 313 - Organic Chemistry Credits: 3
• CHEM 315 - Organic Chemistry Lab I Credits: 2
• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 102 - Introductory Geology II Credits: 4
• EVPP 363 - Coastal Morphology and Processes Credits: 4

One physics sequence, chosen from:
• PHYS 243 - College Physics Credits: 3
• PHYS 244 - College Physics Lab Credits: 1
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1

The following physics course sequence will also satisfy the biology major requirement
• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1

3-4 credits of math chosen from:

• MATH 111 - Linear Mathematical Modeling Credits: 3
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
3 credits of computer science:

- CDS 130 - Computing for Scientists Credits: 3 (recommended by the biology program)
- or any course that fulfills the IT general education requirement

Note:

PHED 255 is strongly recommended but not required.

▲ Concentration in Microbiology (MIB)

This concentration offers lecture and laboratory courses in microbiology to prepare students for employment or advanced study in microbial genetics, physiology, diversity, and related fields.

Students who choose to undertake this concentration must complete their biology course work and the supporting requirements with a minimum GPA of 2.00 and fulfill all requirements for bachelor's degrees including university general education requirements and the additional rules for the BS in biology listed above. Through the course work below, they satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency.

22 credits of biology core courses:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 311 - General Genetics Credits: 4
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 310 - Biodiversity Credits: 5

16 credits of microbiology courses:

- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 405 - Microbial Genetics Credits: 4
- BIOL 406 - Microbial Physiology and Metabolism Credits: 4
- BIOL 407 - Microbial Diversity Credits: 4

6 credits of biology electives chosen from:
• BIOL 385 - Biotechnology and Genetic Engineering Credits: 3
• BIOL 402 - Applied and Industrial Microbiology Credits: 3
• BIOL 403 - Techniques in Applied and Industrial Microbiology Credits: 1
• BIOL 404 - Medical Microbiology Credits: 3
• BIOL 418 - Current Topics in Microbiology Credits: 3
• BIOL 420 - Vaccines Credits: 3
• BIOL 452 - Immunology Credits: 3
• BIOL 453 - Immunology Laboratory Credits: 1
• BIOL 459 - Fungi and Ecosystems Credits: 3
• BIOL 483 - General Biochemistry Credits: 4

18 credits of chemistry:

• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CHEM 313 - Organic Chemistry Credits: 3
• CHEM 314 - Organic Chemistry Credits: 3
• CHEM 315 - Organic Chemistry Lab I Credits: 2
• CHEM 318 - Organic Chemistry Lab II Credits: 2

8 credits of physics:

One sequence, chosen from:

• PHYS 243 - College Physics Credits: 3
• PHYS 244 - College Physics Lab Credits: 1
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1
  The following physics course sequence will also satisfy the biology major requirement
• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1

3-4 credits of math chosen from:

• MATH 111 - Linear Mathematical Modeling Credits: 3
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
3 credits of computer science:

- CDS 130 - Computing for Scientists Credits: 3 (recommended by the biology program)
- or any course that fulfills the IT general education requirement

Medical Technology, BS

Banner Code: SC-BS-MTCH

This program requires the equivalent of three years of full-time preprofessional study at the college level preceding a senior year of professional education in an affiliated school of medical technology. All affiliated schools are accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS).

Responsibility for applying to schools of medical technology and gaining admission rests with the student; however, guidance is provided by the medical technology program director. Admission to medical technology schools is selective, so candidates should strive for strong academic standing. Students who fail to gain admission to a NAACLS-approved school are unable to complete the degree program. Such students may transfer to the biology major without loss of credits.

Application to medical technology schools should be initiated about a year before the desired entrance date. This fact, coupled with the large number of required courses in the preprofessional curriculum, makes it imperative that students in the program consult regularly with the medical technology program coordinator. All medical technology majors and prospective majors are urged to enroll in MTCH 200 as early as possible. This course provides information on the profession, as well as the educational demands placed on candidates.

Students should be aware that the senior year spent off campus requires the following special interpretation of university policies. Transfer students must present at least 16 credits of 300- to 400-level biology or chemistry coursework taken at Mason. No unsatisfactory grades (less than C) may be presented for courses in the senior year of professional study. Transfer students entering with more than 45 transfer credits are often unable to complete the preprofessional phase of their program in the usual three years of full-time study.

Senior students are registered at the university through special procedures. For details, consult the medical technology program coordinator.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements*. In addition, students must complete MTCH 200 and present the following courses in their biology coursework and supporting requirements with a minimum GPA of 2.00. A C or better must be earned in BIOL 213 in order to advance to other major requirements. Students may repeat BIOL 213 once and a second time only with permission of the director of the Undergraduate Biology Program. Medical Technology majors must earn a minimum of C in all biology core courses listed below. Through the course work below, majors satisfy the university-wide general education requirements in natural science, quantitative reasoning, and information technology proficiency. Taking BIOL 453 fulfills the writing intensive requirement.

*Note: Because of the extensive professional education requirements stipulated by NAACLS, students majoring in medical technology are exempt from the university-wide general education requirement in the fine arts.

This program of study is offered by the Biology Undergraduate Program in the College of Science.

Degree Requirements
Biology Core (12 credits)

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 311 - General Genetics Credits: 4

MTCH and BIOL additional courses (17 credits)

- MTCH 200 - Introduction to Medical Technology Credits: 1
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 452 - Immunology Credits: 3
- BIOL 453 - Immunology Laboratory Credits: 1
- BIOL 430 - Advanced Human Anatomy and Physiology I Credits: 4
- BIOL 431 - Advanced Human Anatomy and Physiology II Credits: 4

Chemistry (minimum 18 credits)

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 318 - Organic Chemistry Lab II Credits: 2

Mathematics (3-4 credits)

Choose from:

- MATH 111 - Linear Mathematical Modeling Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

Computer Skills Course (3 credits)

- CDS 130 - Computing for Scientists Credits: 3 (recommended course for this major)
or any course that fulfills the IT general education requirement

Professional Study

30 credits of professional study during the senior year are awarded for clinical education at an affiliated school of medical technology. The distribution of credits in these courses varies with the school of medical technology. No more than 30 professional credits may be applied toward the degree.

Courses that may be awarded for the clinical year include:

- MTCH 401 - Orientation to the Problems and Practices of the Clinical Laboratory Credits: 1-2
- MTCH 402 - Clinical Hematology and Coagulation Credits: 1-8
- MTCH 403 - Clinical Microscopy Credits: 1-3
- MTCH 404 - Serology and Immunohematology Credits: 1-7
- MTCH 405 - Clinical Microbiology Credits: 1-8
- MTCH 406 - Clinical Chemistry Credits: 1-10

Notes:

Students are encouraged to elect additional basic science courses during their preprofessional years. Recommended courses are BIOL 465, 483, 484, and 485; CHEM 321; and PHYS 243, 244, 245, and 246.

Undergraduate Minor

Biology Minor

Banner Code: BIOL

This program of study is offered by the Biology Undergraduate Program in the College of Science.

Course Work

Candidates for the minor in biology must complete 19-21 credits in biology with a minimum GPA of 2.00 or better and must earn a C or better in BIOL 213. Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 311 - General Genetics Credits: 4
- one of the following:
  - BIOL 308 - Foundations of Ecology and Evolution Credits: 5
  - or
  - BIOL 310 - Biodiversity Credits: 5
- Two elective courses in biology
Total: 19-21 credits

Bachelor's/Accelerated Master's Program

Biology, BS/Biology, Accelerated MS

Qualified undergraduates may be admitted to an accelerated master’s program and obtain both a BS and an MS within an accelerated time frame. This program is open only to those students who wish to pursue the master’s degree concentrations in microbiology or molecular biology. Students admitted to this program may take graduate courses after completing 90 undergraduate credits, and up to 6 credits of graduate work may be used in partial satisfaction of the requirements for the undergraduate degree. If students earn at least a 3.00 in these classes, they are granted advanced standing in the master’s program and must then complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met, including a minimum of 18 credits taken for the master’s after the bachelor’s degree is complete.

Students with an overall GPA of at least 3.00 may apply for provisional acceptance to the accelerated master’s program after completing BIOL 213, 214, 308, 310, and 311; and CHEM 313, 314, 315 and 318. Three letters of recommendation, including one from a prospective thesis or project advisor, are required.

After completing 120 credits and all requirements for the bachelor’s degree and filing the Graduation Intent Form, students are awarded a bachelor’s degree. Accelerated master’s students must then submit scores on the GRE to have the provisional qualifier removed. Ordinarily, students should receive a minimum combined score of 1,100 on the verbal and quantitative portions of the general test and be in at least the 50th percentile on the subject exam.

This program of study is jointly offered by the School of Systems Biology and the Biology Undergraduate Program in the College of Science.

Chemistry and Biochemistry

Phone: 703-993-1070
Web: chemistry.gmu.edu

Faculty

Professors: Cozzens, Foster, Hussam, Mose, Mushrush

Associate professors: Bishop, Born, Honeychuck, Schreifels (Chair), Slayden, Weatherspoon (Associate Chair)

Assistant professors: Cooper, Couch

Term associate professor: Hatton

Term assistant professors: Hamblet, Kort, Pant, Pettigrew

Course Work
This department offers all course work designated CHEM in the Courses chapter of this catalog.

**Writing-Intensive Requirement**

Mason requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in chemistry fulfill this requirement by successfully completing CHEM 336 or 465.

**Honors Program in Chemistry**

Chemistry majors who have completed prerequisites for CHEM 455 and 456 Honors Research in Chemistry and have maintained an overall GPA of at least 3.00 in mathematics and science courses are eligible to enter the departmental honors program. To graduate with honors in chemistry, a student is required to maintain a minimum GPA of 3.00 in mathematics and science courses and successfully complete the two semesters of CHEM 455 and 456 with a minimum GPA of 3.50.

**Premedical, Predental, Prepharmacy, and Preveterinary Students**

Web: prehealth.gmu.edu

Many students planning medical, dental, pharmacy, veterinary, optometry, or other health professional careers choose to pursue a major in chemistry. These students should consult the health professions advising web site on required course work and overall preparation.

**Prepharmacy Society**

Mason students who are interested in pursuing careers in pharmacy are encouraged to participate in the Prepharmacy Society. This student organization organizes supplemental programming focused toward pharmacy as a career.

**Chemistry Club**

The Chemistry Club provides a social and informational network for students. It serves the Department of Chemistry and Biochemistry by sponsoring informational programs and allowing students to work at university events.

**Teacher Licensure**

Students who wish to become teachers should consult the College of Education and Human Development chapter and attend an information session early in their undergraduate career. For more information, call 703-993-2892, e-mail gseadmit@gmu.edu, or go to gse.gmu.edu.

**Graduate Degree Programs**

The department offers an MS in chemistry with a research project (thesis option) or an all-course-work program (nonthesis option). Within the MS, students may pursue a concentration in biochemistry. The PhD in all branches of chemistry is available through the PhD program in Chemistry and Biochemistry. Students may also pursue Chemistry-related PhD research through the Environmental Science and Policy PhD program and the Bioscience PhD program. An area of emphasis in computational chemistry is available through the PhD in computational sciences and informatics program offered in conjunction with the School of Physics, Astronomy, and Computational Sciences.

**Chemistry, Bachelor’s/Accelerated Master’s Degree**
Qualified undergraduates may be admitted to an accelerated master’s program and obtain both a BS and an MS in Chemistry within an accelerated time frame. Students admitted to this program may take graduate courses after completing 90 undergraduate credits, and up to 6 credits of graduate work may be used in partial satisfaction of the requirements for the undergraduate degree. If students earn at least a 3.00 GPA in these classes, they are granted advanced standing in the master’s program and must then complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met, including a minimum of 18 credits taken for the master’s degree after the bachelor’s degree is complete.

Undergraduate Degree

Chemistry, BA

Banner Code: SC-BA-CHEM

This program, when coordinated with the necessary courses in education, meets requirements for teacher licensure. It also meets requirements for entrance to medical and other professional schools.

Students must fulfill all requirements for bachelor's degrees including university general education requirements. Students majoring in chemistry must complete additional college requirements for the BA degree in COS. In addition to satisfying the university-wide general education requirements and the program requirements for the BA degrees, students majoring in chemistry must complete the chemistry program requirements with a minimum GPA of 2.30 and present no more than two courses with a grade of D (1.00) in CHEM coursework at graduation. Through the course work below, chemistry majors satisfy the university-wide general education requirements in natural science and quantitative reasoning.

Both CHEM 336 and CHEM 465 fulfill the writing intensive for students in chemistry.

This program of study is offered by the Department of Chemistry and Biochemistry in the College of Science.

Degree Requirements

37 credits of chemistry:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 318 - Organic Chemistry Lab II Credits: 2
- CHEM 321 - Elementary Quantitative Analysis Credits: 4
- CHEM 331 - Physical Chemistry I Credits: 3
- CHEM 332 - Physical Chemistry II Credits: 3
- CHEM 336 - Physical Chemistry Lab I Credits: 2
- CHEM 337 - Physical Chemistry Lab II Credits: 2
- 5 credits of electives in chemistry

11 credits of math:
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• MATH 213 - Analytic Geometry and Calculus III Credits: 3

8 credits of physics:

• PHYS 243 - College Physics Credits: 3
• PHYS 244 - College Physics Lab Credits: 1
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1
or the alternative sequence
• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1

Total: 56 credits

▲ Concentration in Biochemistry (BC)

The concentration in biochemistry is designed for students interested in studying chemistry at its interface with the biological sciences. Those interested in health science careers can obtain an excellent science background through this concentration.

In addition to satisfying the university-wide general education requirements and requirements for the BA degree in COS, students majoring in chemistry with a concentration in biochemistry will complete the alternative requirements for the major plus the concentration expressed below. In doing so, majors satisfy the university-wide general education requirements in natural science and quantitative reasoning.

37 credits of chemistry:

• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CHEM 313 - Organic Chemistry Credits: 3
• CHEM 314 - Organic Chemistry Credits: 3
• CHEM 315 - Organic Chemistry Lab I Credits: 2
• CHEM 318 - Organic Chemistry Lab II Credits: 2
• CHEM 321 - Elementary Quantitative Analysis Credits: 4
• CHEM 331 - Physical Chemistry I Credits: 3
• CHEM 332 - Physical Chemistry II Credits: 3
• CHEM 446 - Bioinorganic Chemistry Credits: 3
• CHEM 463 - General Biochemistry I Credits: 4
• CHEM 465 - Biochemistry Lab Credits: 2
11 credits of math and statistics:

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- STAT 250 - Introductory Statistics I Credits: 3

8 credits of physics:

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1

4 credits of biology:

- BIOL 213 - Cell Structure and Function Credits: 4

Total: 60 credits

Chemistry, BS

Banner Code: SC-BS-CHEM

This program is approved by the American Chemical Society; on completion, students are certified to the society. Students planning professional careers in chemistry should choose this degree.

In addition to satisfying all requirements for bachelor’s degrees including university general education requirements, students majoring in chemistry must complete the chemistry program requirements with a minimum GPA of 2.30 and present no more than two courses with a grade of D (1.00) in CHEM coursework at graduation. (Through the course work below, chemistry majors satisfy the university-wide requirements in natural science and quantitative reasoning. CHEM 336 or CHEM 465 fulfills the writing intensive requirement for students majoring in chemistry.)

CHEM 336 or CHEM 465 fulfills the writing intensive requirement for students majoring in chemistry.

This program of study is offered by the Department of Chemistry and Biochemistry in the College of Science.

Degree Requirements

Students who do not select an optional concentration complete the curriculum requirements listed below.

44 credits of chemistry:
• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4
• CHEM 313 - Organic Chemistry Credits: 3
• CHEM 314 - Organic Chemistry Credits: 3
• CHEM 315 - Organic Chemistry Lab I Credits: 2
• CHEM 318 - Organic Chemistry Lab II Credits: 2
• CHEM 321 - Elementary Quantitative Analysis Credits: 4
• CHEM 331 - Physical Chemistry I Credits: 3
• CHEM 332 - Physical Chemistry II Credits: 3
• CHEM 336 - Physical Chemistry Lab I Credits: 2
• CHEM 337 - Physical Chemistry Lab II Credits: 2
• CHEM 441 - Properties and Bonding of Inorganic Compounds Credits: 3
• CHEM 463 - General Biochemistry I Credits: 4
• CHEM 445 - Inorganic Preparations and Techniques Credits: 2
  or
• CHEM 465 - Biochemistry Lab Credits: 2
• and three credits of chemistry electives

6 credits of in-depth electives chosen from:

• CHEM 422 - Instrumental Analysis Credits: 3
• CHEM 427 - Aquatic Environmental Chemistry Credits: 3
• CHEM 438 - Atmospheric Chemistry Credits: 3
• CHEM 446 - Bioinorganic Chemistry Credits: 3
• CHEM 458 - Chemical Oceanography Credits: 3
• CHEM 464 - General Biochemistry II Credits: 3
• CHEM 467 - The Chemistry of Enzyme-Catalyzed Reactions Credits: 3
• CHEM 468 - Bioorganic Chemistry Credits: 3

1-3 credits from the following:

• CHEM 423 - Instrumental Analysis Laboratory Credits: 2
• CHEM 355 - Undergraduate Research Credits: 1-3
• CHEM 451 - Special Projects in Chemistry Credits: 1-3
• CHEM 452 - Special Projects in Chemistry Credits: 1-3
• CHEM 455 - Honors Research in Chemistry Credits: 3
• CHEM 456 - Honors Research in Chemistry Credits: 3

11 credits of math:
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 213 - Analytic Geometry and Calculus III Credits: 3

8 credits of physics:

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

▲ Concentration in Analytical and Environmental Chemistry (AEC)

Students planning professional careers in an industry involving chemical measurements, careers with a chemistry emphasis in the environmental science, or those seeking graduate study in analytical or environmental chemistry should choose this program. This concentration meets the requirements for certification by the American Chemical Society (ACS).

In addition to satisfying university-wide general education requirements for the BS degree, students majoring in chemistry with a concentration in analytical and environmental chemistry must complete the chemistry program requirements with a minimum GPA of 2.30 and present no more than two courses with a grade of D (1.00) in CHEM coursework at graduation. (Through the coursework below, chemistry majors satisfy the university-wide requirements in natural science and quantitative reasoning.)

52 credits of chemistry

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 318 - Organic Chemistry Lab II Credits: 2
- CHEM 321 - Elementary Quantitative Analysis Credits: 4
- CHEM 331 - Physical Chemistry I Credits: 3
- CHEM 332 - Physical Chemistry II Credits: 3
- CHEM 336 - Physical Chemistry Lab I Credits: 2
- CHEM 337 - Physical Chemistry Lab II Credits: 2
- CHEM 422 - Instrumental Analysis Credits: 3
- CHEM 423 - Instrumental Analysis Laboratory Credits: 2
- CHEM 438 - Atmospheric Chemistry Credits: 3
- CHEM 463 - General Biochemistry I Credits: 4
- CHEM 427 - Aquatic Environmental Chemistry Credits: 3
or
• CHEM 458 - Chemical Oceanography Credits: 3

• CHEM 441 - Properties and Bonding of Inorganic Compounds Credits: 3
or
• CHEM 446 - Bioinorganic Chemistry Credits: 3

• CHEM 445 - Inorganic Preparations and Techniques Credits: 2
or
• CHEM 465 - Biochemistry Lab Credits: 2

8 credits of physics

• PHYS 243 - College Physics Credits: 3
• PHYS 244 - College Physics Lab Credits: 1
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1
or the alternative sequence
• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1

11 credits of math

• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• MATH 213 - Analytic Geometry and Calculus III Credits: 3

7-8 credits of supporting science electives from one of three options

Option 1:
• GEOL 101 - Introductory Geology I Credits: 4
• GEOL 309 - Introduction to Oceanography Credits: 3

Option 2:
• EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
• EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4

Option 3:
• CHEM 341 - Fundamental Inorganic Chemistry Credits: 3
and at least four additional credits chosen from:

- CHEM 355 - Undergraduate Research Credits: 1-3
- CHEM 451 - Special Projects in Chemistry Credits: 1-3
- CHEM 452 - Special Projects in Chemistry Credits: 1-3

The discipline sequences may be interchanged only with approval by the program coordinator.

▲ Concentration in Biochemistry (BC)

Students planning professional careers in biochemistry, the pharmaceutical industry, medicine, biotechnology, or related fields with a chemistry emphasis should choose this program instead of the traditional BS in chemistry. This concentration provides students with a focus on biochemistry while retaining a strong chemistry foundation. Students are allowed to tailor the concentration to their interests with 9 credits of electives.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students majoring in chemistry with a concentration in biochemistry must complete the following courses with a minimum GPA of 2.30. No more than two courses with a grade of D (1.00) in CHEM coursework may be applied to the major. Through the course work below, students satisfy the university-wide requirements in natural science and quantitative reasoning.

39 credits of chemistry courses:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 318 - Organic Chemistry Lab II Credits: 2
- CHEM 321 - Elementary Quantitative Analysis Credits: 4
- CHEM 331 - Physical Chemistry I Credits: 3
- CHEM 336 - Physical Chemistry Lab I Credits: 2
- CHEM 446 - Bioinorganic Chemistry Credits: 3
- CHEM 463 - General Biochemistry I Credits: 4
- CHEM 464 - General Biochemistry II Credits: 3
- CHEM 465 - Biochemistry Lab Credits: 2

8 credits of math:

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

8 credits of physics:

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1
- or the alternative sequence
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

8 credits of biology:

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1

Approved Science Electives

- 9 credits of approved science electives chosen from chemistry or biology courses at 302 or above (Courses from other disciplines may be submitted as electives, subject to approval of the coordinator.)

▲ Concentration in Chemistry Education (CHME)

Those interested in teaching high school chemistry should choose this concentration. This concentration is approved by the American Chemical Society and leads to state licensure to teach in Virginia upon completion of the degree.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students with a concentration in chemistry education must present the following:

38 credits of chemistry courses:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 321 - Elementary Quantitative Analysis Credits: 4
- CHEM 331 - Physical Chemistry I Credits: 3
- CHEM 446 - Bioinorganic Chemistry Credits: 3
- CHEM 463 - General Biochemistry I Credits: 4

- CHEM 336 - Physical Chemistry Lab I Credits: 2
  or
- CHEM 465 - Biochemistry Lab Credits: 2
• CHEM 470 - Laboratory Instructional Methods for Chemistry Credits: 3
• one 3- credit upper-level chemistry elective

11 credits of math:

• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• STAT 250 - Introductory Statistics I Credits: 3

8 credits of physics:

• PHYS 243 - College Physics Credits: 3
• PHYS 244 - College Physics Lab Credits: 1
• PHYS 245 - College Physics Credits: 3
• PHYS 246 - College Physics Lab Credits: 1
  or the alternative sequence
• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1

8 credits of other general science:

• GEOL 101 - Introductory Geology I Credits: 4
• BIOL 103 - Introductory Biology I Credits: 4
  or
• BIOL 213 - Cell Structure and Function Credits: 4

Teacher Licensure Requirement (21 credits):

• EDCI 473 - Teaching Science in the Secondary School Credits: 3
• EDCI 483 - Advanced Methods of Teaching Science in Secondary School Credits: 3
• EDCI 490 - Student Teaching in Education Credits: 6
• EDRD 419 - Literacy in the Content Areas Credits: 3
• EDUC 372 - Human Development, Learning, and Teaching Credits: 3
• EDUC 422 - Foundations of Secondary Education Credits: 3

Notes:
The course work above satisfies university-wide requirements in natural science, information technology, and quantitative reasoning.

During the sophomore year, students should contact the Graduate School of Education to arrange to attend an information session and take the PRAXIS I and II exams.

**Undergraduate Minor**

**Chemistry Minor**

Banner Code: CHEM

The department offers a minor in chemistry. The program requires 16 credits of chemistry at the 300 level or above with a minimum GPA of 2.00. Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

This program of study is offered by the Department of Chemistry and Biochemistry in the College of Science.

**Total: 16 credits**

**Bachelor's/Accelerated Master's Program**

**Chemistry, BS/Chemistry, Accelerated MS**

A five-year bachelor’s/accelerated master’s degree program leads to a research-based MS degree following satisfactory completion of 144 credits. It allows academically strong undergraduates with a commitment to research to obtain BS and MS degrees within five academic years plus the summer of the last year. On completion of this program, students will be exceptionally well prepared for entry into a professional school or a PhD program in chemistry or a related discipline. Students are eligible to enter this program and enroll in graduate courses after successfully completing 90 credits, inclusive of prerequisites, toward the BS degree. This flexibility makes it possible for students to complete some of their graduate classes during their junior and senior years. Consult the department for details on the program.

Students admitted to the accelerated programs may use up to 6 earned credits in partial satisfaction of the requirements for the undergraduate degree. On completion of the undergraduate degree and with satisfactory performance (3.00) in the graduate courses, students are given advanced standing in the master’s program and can complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met.

This program of study is offered by the Department of Chemistry and Biochemistry in the College of Science.

**Master's Degree**

**Chemistry, MS**
The MS in chemistry provides advanced training for recent college graduates, professionals in teaching, and technical workers in research organizations who have an interest in chemistry or biochemistry.

This program of study is offered by the Department of Chemistry and Biochemistry in the College of Science.

**Admission Requirements**

To be considered for admission to degree status, students must have a bachelor’s degree in chemistry, biochemistry, or a related field from an accredited institution and must meet general admission requirements for graduate study. Admission is based on a departmental evaluation of the applicant’s background as evidenced by transcripts and letters of recommendation. Applicants who received a bachelor’s degree more than five years before the application date must submit a résumé.

**Degree Requirements**

To receive an MS in chemistry, students must complete 30 credits of graduate work. The thesis option is designed for students planning to pursue a doctoral degree or a career involving research in the chemical, biochemical, environmental, or pharmaceutical industries. The thesis is based on research that must be preapproved by the thesis or advisory committee, which is appointed prior to the first semester of registration in CHEM 799. Students who select the thesis option complete 6 credits of 799 and present a seminar followed by an oral defense. Students in this option are expected to choose a laboratory advisor during their first semester in the program and begin working on their thesis project no later than the second semester.

The nonthesis option is designed for those seeking to go on to professional school, teach chemistry in secondary schools, or pursue other careers in which advanced work in chemistry is necessary or advantageous. Students selecting this option are not required to complete a laboratory-based thesis. Instead, they are required to take an additional elective in chemistry (or biochemistry) and complete a research project or gain teaching experience in undergraduate chemistry labs, as described below.

CHEM 500 and 501 may not be applied toward the MS degree. CHEM 502 through 510 may be applied toward the MS degree only with prior written approval of the department.

**Core Courses (9 credits):**

All students in the Chemistry MS program take 9 credits of chemistry core courses. The three courses must be selected from three different core areas as shown below. Core courses may also be taken as electives beyond the stated credit requirement for each option.

Choose a total of three courses (9 credits) from three different core areas below:

**Analytical**

- CHEM 624 - Principles of Chemical Separation Credits: 3

**Biochemistry**

- CHEM 660 - Protein Biochemistry Credits: 3
• CHEM 662 - Modern Methods of Drug Discovery Credits: 3

Environmental

• CHEM 651 - Environmental Chemistry of Organic Substances Credits: 3

Inorganic

• CHEM 646 - Bioinorganic Chemistry Credits: 3

Organic

• CHEM 613 - Modern Polymer Chemistry Credits: 3
• CHEM 614 - Physical Organic Chemistry Credits: 3
• CHEM 617 - Organic Structural Spectroscopy Credits: 3

General Chemistry (21 credits)

Students who do not wish to pursue a concentration complete the following requirements for either the thesis or nonthesis option.

Thesis Option

This program is specifically designed for students who wish to pursue a doctoral degree or a career in the chemical industry.

In addition to the 9 credits of general core courses, students must complete the following requirements:

One Additional Core Course (3 credits):

• CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3

Chemistry Electives (9 credits):

• 3 credits of CHEM designated courses
• 6 credits of courses in chemistry or related fields, approved by the Graduate Committee prior to registration

Seminar/Thesis (9 credits):
• 3 credits of CHEM 790 - Graduate Seminar Credits: 1
• 6 credits of CHEM 799 - Master’s Thesis Credits: 1-6

Total: 30 credits

Nonthesis Option

This program is specifically designed for students seeking to go on to professional school, teach chemistry in secondary schools, or pursue other careers in which advanced work in chemistry is necessary or advantageous.

In addition to the 9 credits of general core courses, students must complete the following requirements:

One Additional Core Course (3 credits):

• CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3

Chemistry Electives (12 credits):

• 6 credits of CHEM designated courses
• 6 credits of courses in chemistry or related fields, approved by the Graduate Committee prior to registration

Teaching/Research (3 credits):

Any combination of CHEM 579 and CHEM 670 may be used to fulfill this requirement. However, CHEM 579 may be used to fulfill this requirement only with prior written approval of the department and must be used to complete a laboratory- or library-based research project or enhance the student’s teaching skills.

• CHEM 579 - Special Topics Credits: 1-6
• CHEM 670 - Teaching Practicum Credits: 1-2

Seminar (3 credits):

• 3 credits of CHEM 790 - Graduate Seminar Credits: 1

Total: 30 credits
Concentration in Biochemistry (BC) (21 credits)

Students who wish to pursue an optional concentration in Biochemistry complete the following requirements for either the thesis or nonthesis option.

Thesis Option

This program is specifically designed for students who wish to pursue a doctoral degree or a career in the biochemical or pharmaceutical industry.

In addition to the 9 credits of general core courses, students must complete the following requirements:

One Additional Core Course (3 credits):

Students take either CHEM 531 or CHEM 633 as instructed by the Graduate Admissions Committee

- CHEM 531 - Elements of Physical Chemistry Credits: 3
- CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3

Biochemistry Electives (6 credits):

- 6 credits of electives in biochemistry or related fields with approval from department

Chemistry Electives (3 credits):

- 3 credits of CHEM designated courses

Seminar/Thesis (9 credits):

- 3 credits of CHEM 790 - Graduate Seminar Credits: 1
- 6 credits of CHEM 799 - Master's Thesis Credits: 1-6

Total: 30 credits

Nonthesis Option

This program is specifically designed for students seeking to go on to professional school, teach biochemistry in secondary schools, or pursue other careers in which advanced work in biochemistry is necessary or advantageous.

In addition to the 9 credits of general core courses, students must complete the following requirements:

One Additional Core Course (3 credits):
Students take either CHEM 531 or CHEM 633 as instructed by the Graduate Admissions Committee

- CHEM 531 - Elements of Physical Chemistry Credits: 3
  or
- CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3

Biochemistry Electives (9 credits):

- 9 credits of electives in biochemistry or related fields with approval from department

Chemistry Electives (3 credits):

- 3 credits of CHEM designated courses

Teaching/Research (3 credits):

Any combination of CHEM 579 and CHEM 670 may be used to fulfill this requirement. However, CHEM 579 may be used to fulfill this requirement only with prior written approval of the department and must be used to complete a laboratory- or library-based research project or enhance the student’s teaching skills.

- CHEM 579 - Special Topics Credits: 1-6
- CHEM 670 - Teaching Practicum Credits: 1-2

Seminar (3 credits):

- 3 credits of CHEM 790 - Graduate Seminar Credits: 1

Total: 30 credits

Doctoral Degree

Chemistry and Biochemistry, PhD

Banner Code: SC-PHD-CBCM

The Chemistry and Biochemistry doctoral program is intended to prepare students for advanced work in the chemical sciences and related areas. Graduates with the PhD degree in this field can seek employment in research and development, process control, or higher education. In addition to these traditional science career paths, graduates are also positioned to pursue careers in non-traditional areas such as the intellectual property and regulatory fields. The program is designed to provide students with a firm foundation in advanced coursework, which is followed by an independent research project completed under the guidance of a
faculty advisor. The culmination of the program is a dissertation representing original research that is publishable in a peer-reviewed scientific journal. The program requires 72 total credits of coursework and dissertation.

This program of study is offered by the Department of Chemistry and Biochemistry in the College of Science.

Admission Requirements

The Chemistry and Biochemistry PhD program is intended for students who have completed an undergraduate program of study in chemistry, biochemistry, or a related field. Applicants are expected to have a BS degree with a minimum GPA of 3.00, and acceptable GRE and TOEFL scores (if applicable). Applicants with a BS degree in other fields of study who have at least three years of chemistry or biochemistry coursework may be accepted provisionally and may be required to successfully complete selected remedial courses, some of which may not be applicable towards PhD requirements. Interested students should submit a completed GMU Graduate Application, three letters of reference, official reports of GRE and TOEFL exam scores, and a personal/goals statement outlining their general research interests and career plans.

Reduction of Credit

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

Degree Requirements

Upon acceptance into the Chemistry and Biochemistry PhD program, a student will be assigned an academic advisor. Prior to registering for classes, students are required to meet with their academic advisors who will provide guidance in selecting courses that are consistent with the student’s area of interest. Once a student has selected a research/dissertation advisor, that person then assumes the role of providing academic advisement to the student.

The program requires 72 total credits of coursework and dissertation. All students in the Chemistry and Biochemistry PhD program take a common core of four courses. By working with the Dissertation Committee, a student may choose to specialize in an emphasis area such as analytical, biochemistry, environmental, inorganic, organic, or physical chemistry, or others according to his or her particular interests.

A student may choose up to 24 credits in general elective graduate courses that can be applied towards the degree requirements with the approval of the dissertation advisor and the program director. Core courses not used to satisfy the core requirement can be used as elective credits.

Doctoral Course Work (48 credits)

Core Courses (12 credits)

- CHEM 814 - Advanced Bioorganic Chemistry Credits: 3
- CHEM 821 - Theory of Analytical Processes Credits: 3
- CHEM 833 - Physical Chemistry and Biochemistry Credits: 3
- CHEM 891 - Doctoral Scientific Critique, Writing and Presentation Credits: 3
Research Emphasis Courses (9 credits)

The purpose of the research emphasis courses is to provide the students with an in-depth theoretical foundation in their chosen area of expertise. Research emphasis courses are selected in consultation with the student’s research advisor.

Students are required to select 9 additional chemistry credits (3 courses) in one of the three research emphasis areas listed below.

Analytical and Environmental Chemistry

- CHEM 554 - Geochemistry of Environmental Hazards Credits: 3
- CHEM 620 - Modern Instrumentation Credits: 3
- CHEM 624 - Principles of Chemical Separation Credits: 3
- CHEM 625 - Electroanalytical Chemistry Credits: 3
- CHEM 651 - Environmental Chemistry of Organic Substances Credits: 3
- CHEM 728 - Introduction to Solid Surfaces Credits: 3

Protein Biochemistry

- CHEM 567 - The Chemistry of Enzyme-Catalyzed Reactions Credits: 3
- CHEM 613 - Modern Polymer Chemistry Credits: 3
- CHEM 646 - Bioinorganic Chemistry Credits: 3
- CHEM 660 - Protein Biochemistry Credits: 3
- CHEM 661 - Antibiotic Chemistry and Resistance Credits: 3
- CHEM 662 - Modern Methods of Drug Discovery Credits: 3
- CHEM 665 - Protein-Protein Interactions: Methods and Applications Credits: 3
- CHEM 735 - Astrophysical Chemistry of Planetary Bodies Credits: 3
- CHEM 767 - Industrial Biochemistry Credits: 3

Physical Chemistry and Spectroscopy

- CHEM 614 - Physical Organic Chemistry Credits: 3
- CHEM 617 - Organic Structural Spectroscopy Credits: 3
- CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3
- CHEM 732 - Quantum Chemistry Credits: 3
- CHEM 733 - Polymer Physical Chemistry Credits: 3
- CHEM 735 - Astrophysical Chemistry of Planetary Bodies Credits: 3
- CHEM 736 - Computational Quantum Mechanics Credits: 3

Seminar (3 credits)
• CHEM 790 - Graduate Seminar Credits: 1 (taken three times)

Electives (24 credits)

24 credits of approved elective courses chosen in consultation with the student's advisor

Dissertation Committee and Supervisor

By the end of their first year, students in the program are expected to have selected a dissertation/research supervisor and to have formed their dissertation committee. This committee will consist of at least 4 graduate faculty members (including the dissertation supervisor), with at least 2 members from the Department of Chemistry and Biochemistry. At least one member must be from outside the department. Qualified individuals who are not members of the graduate faculty, including faculty at other universities or government laboratories, may serve on the committee with the approval of the program director and the associate dean for graduate programs.

Candidacy Examinations

The student must successfully complete separate written and oral candidacy examinations prepared and administered by the dissertation committee.

Dissertation Proposal and Advancement to Candidacy

Based upon the committee’s familiarity with the student’s progress in the research project, the committee will determine whether a candidate is ready to write and defend the dissertation. With the approval of the dissertation committee, the student will enroll in Doctoral Dissertation Proposal (CHEM 998).

Students advance to doctoral candidacy by fulfilling the following requirements:

• The student prepares a dissertation proposal describing in detail the planned dissertation research. The proposal must be approved by the dissertation committee.
• The student must successfully complete candidacy examinations as stated above.
• Following successful completion of the research proposal and candidacy exams, the committee will recommend the student for advancement to doctoral candidacy.

Dissertation Research (24 credits)

No more than 24 combined credits from CHEM 998 and CHEM 999 may be applied toward satisfying doctoral degree requirements, with no more than 12 credits of CHEM 998.

• CHEM 998 - Doctoral Dissertation Proposal Credits: 1-12
• CHEM 999 - Doctoral Dissertation Research Credits: 1-12

Dissertation Research and Defense

With the approval of the dissertation committee, the student will enroll in Doctoral Dissertation Proposal (CHEM 998) and Doctoral Dissertation Research (CHEM 999). The dissertation research should represent a significant contribution to the
appropriate scientific field(s), and it should be deemed to represent a body of work that is publishable in a refereed scientific journal. The dissertation must be presented and defended in a public forum consisting of the dissertation committee and other interested members of the George Mason University community.

Total: 72 credits

■ Environmental Science and Policy

Phone: 703-993-1043
Web: esp.gmu.edu

Faculty

Professors: Jones, Lawrey, Lovejoy, Rockwood

Term professor: Talbot

Associate professors: Aguilar, Ahn, Balint, Birchard, Crate, Edwards, Gillevet, Jonas (Chair), Macfarlane, Parsons, Torzilli, Weeks

Assistant professors: Forkner, Kennedy, Manca

Term associate professors: Sklarew

Term assistant professors: de Mutsert, Kim, Largen, Peters

Research associate professor: Litchfield

Emeritus professors: Bradley, Ernst, Kelso, Shaffer, Skog

Other Environmental Program Faculty

Professors: Beach, Black, Chandhoke, Conlan, Diecchio, Foster, Gifford, Haack, Houck, Mose, Mushrush, Nadeau, Regan, Rowan, Sage, Schum, Wan, Willett, Wong

Associate professors: Christensen, Conant, deMonsabert, Fryxell, Guagnano, Honeychuck, Kozlowski, Mahler, McBride, Meyer, Paden, Palkovich, Rodgers, Royt, Seto, Stough, Wood

Assistant professor: Kysar-Mattietti

Term associate professors: Verardo

Term assistant professors: Nord


Course Work
This department offers all course work designated EVPP and numerous BIOL courses, listed in the Courses chapter of this catalog.

**Other Undergraduate Programs**

In addition to its own undergraduate programs, the Environmental Science and Policy department also works closely with and provides administrative input to other undergraduate programs.

In concert with the Biology Undergraduate Program, through which the BA and BS degrees in biology are offered, Environmental Science and Policy administers the environmental and conservation biology and the marine and freshwater biology concentrations.

The Concentration in Environmental and Conservation Biology (ESCB) within the BS in Biology is offered to students seeking a biology degree that focuses on ecology and organismal biology and prepares them for graduate work or employment in environmental and conservation fields, such as natural resources management, fisheries, forestry, water quality management, aquatic and wetland ecology, and conservation biology.

The Concentration in Marine and Freshwater Biology within the BS in Biology is offered to students seeking a biology degree that focuses on marine and freshwater biology and prepares them for graduate work or employment in aquatic, marine and fisheries fields.

Refer to the Biology Undergraduate Program section for more information on Biology, BS program and these two concentrations.

Environmental Science and Policy and the department of Geography and Geoinformation Sciences cooperatively offer the BS in Global and Environmental Change. This interdisciplinary undergraduate program, one of the first of its kind in the nation, distinguishes itself from the other degrees in the natural sciences in that it examines from local, regional, and global scales the dynamics of Earth's systems and their interactions: the geosphere, the atmosphere, the ecosphere, and the sociosphere. Refer to the GGS section for more information on the Global and Environmental Change, BS program.

The Environmental Science and Policy department also offers (jointly with the College of Humanities and Social Sciences) the BA in Environmental and Sustainability Studies, which focuses on the theoretical and practical knowledge of three aspects of environmental and sustainability studies: people, prosperity, and planet. In addition to required core courses, students obtain additional in-depth knowledge in their selected concentration area. This degree prepares students for employment and graduate study in fields related to social justice, business and public policy, and environmental protection as they relate to the environment and sustainability. Students should consult the full set of program requirements by viewing the complete description for the BA in Environmental and Sustainability Studies. The Environmental Science and Policy department administers the following two concentrations:

- The Concentration in Climate Change and Society focuses on the relationship between human action and climate evolution. Topics include global warming, pollution, and societal trends.
- The Concentration in Environmental Policy and Politics focuses on the role of policy formulation in the management of the global ecosystem. Topics include resource management and sustainability.

**Other Graduate Programs**

In addition to its own graduate programs, the Environmental Science and Policy department also participates in the MS in Earth Systems Science administered primarily through the Department of Geography and Geoinformation Science (GGS). Please see the GGS listing for program requirements.

The Environmental Science and Policy department also offers (jointly with the Institute for Conflict Analysis and Resolution) the Graduate Certificate in Environmental Conflict Resolution and Collaboration, which focuses on a systems approach to environmental conflict and how to understand its legal, regulatory, and ecological implications. Coursework addresses the
strategic thinking that is required for assessing and designing appropriate environmental conflict resolution processes, as well as understanding the public interest and the intertwined questions of social justice and sustainability that make environmental conflict particularly important and challenging.

**Undergraduate Degree**

**Environmental Science, BS**

**Banner Code: SC-BS-EVSC**

The BS in environmental science provides students with rigorous training in the fundamental science of the environment, and the application of the key scientific principles to the analysis of environmental processes and problems and to the development of practical responses to those problems. The program covers the fundamental techniques of environmental science and engineering, protection and improvement of environmental quality, environmental policy, risk assessment and risk management, and public and private decision-making processes. Graduates of the program are prepared to undertake careers in a variety of environmental science fields, and are also qualified to pursue advanced scientific/professional education.

Students select a concentration in ecological science, aquatic ecology, environmental health, human and ecosystem response to climate change, or conservation. Through the course work below, environmental science majors satisfy the university-wide requirements in natural science, quantitative reasoning, and synthesis. Students can fulfill the writing intensive requirement for this major by taking BIOL 308.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements.

For policies governing all undergraduate degrees, see the Academic Policies chapter of the catalog.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

This program of study is offered by the Department of Environmental Science and Policy in the College of Science.

**Degree Requirements**

**Core Requirements**

**Environmental Science (36 credits):**

- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4
- EVPP 305 - Environmental Microbiology Essentials Credits: 3
- EVPP 306 - Environmental Microbiology Essentials Laboratory Credits: 1
- BIOL 308 - Foundations of Ecology and Evolution Credits: 5
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- EVPP 361 - Introduction to Environmental Policy Credits: 3
• EVPP 377 - Applied Ecology Credits: 3
• EVPP 430 - Fundamentals of Environmental Geographic Information Systems Credits: 3
and one of the following 2 courses:
• EVPP 336 - Human Dimensions of the Environment Credits: 3 *
or
• EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
and one of the following 4 courses:
• EVPP 335 - People, Plants, and Culture Credits: 3
• PHIL 343 - Topics in Environmental Philosophy Credits: 3
• GEOL 420 - Earth Science and Policy Credits: 3
• GGS 303 - Conservation of Resources and Environment Credits: 3
  *Students in the Human and Ecosystem Response to Climate Change concentration may not take EVPP 336 to fulfill
this portion of the core. They must take EVPP 337.

Chemistry (8 credits):

• CHEM 211 - General Chemistry Credits: 4
• CHEM 212 - General Chemistry Credits: 4

Mathematics (8 credits):

• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4

Geology (4 credits):

• GEOL 101 - Introductory Geology I Credits: 4

Concentrations

Students select a concentration in aquatic ecology, conservation, ecological science, environmental health, human and ecosystem
response to climate change. Students take 24 credits of course work as indicated below for the selected concentration.

▲ Concentration in Aquatic Ecology (AQEC)

Students must take a minimum of 24 credits from the following:

• EVPP 350 - Freshwater Ecosystems Credits: 4
• EVPP 421 - Marine Conservation Credits: 3
• BIOL 309 - Introduction to Oceanography Credits: 3
• BIOL 449 - Marine Ecology Credits: 3
and at least 11 credits from the following:
• EVPP 363 - Coastal Morphology and Processes Credits: 4
• EVPP 380 - Wetlands of the World Credits: 4
• EVPP 419 - Marine Mammal Biology and Conservation Credits: 3
• EVPP 420 - Marine Mammal Biology and Conservation Field Course Credits: 1
• EVPP 536 - Ichthyology Credits: 4
• BIOL 440 - Field Biology Credits: 1-4
• GEOL 364 - Marine Geology Credits: 3
• GEOL 458 - Chemical Oceanography Credits: 3
• CLIM 412 - Physical Oceanography Credits: 3
• NCLC 318 - Exploring Virginia's Watersheds Credits: 4
• additional courses approved by the program coordinator

Total: 24 credits

▲ Concentration in Conservation (CNSV)

Students must take 24 credits from the following:

• BIOL 310 - Biodiversity Credits: 5
• EVPP 318 - Conservation Biology Credits: 3
• EVPP 419 - Marine Mammal Biology and Conservation Credits: 3
• EVPP 420 - Marine Mammal Biology and Conservation Field Course Credits: 1
• EVPP 421 - Marine Conservation Credits: 3
• CONS 320 - Conservation in Practice Credits: 3
• CONS 401 - Conservation Theory Credits: 3
• CONS 402 - Applied Conservation Credits: 4
• CONS 403 - Ecology and Conservation Theory Credits: 3
• CONS 404 - Monitoring and Assessment of Biodiversity Credits: 4
• CONS 410 - Human Dimensions in Conservation Credits: 3
• CONS 411 - Science Communication for Conservation Credits: 3
• CONS 420 - Human-Wildlife Conflict Credits: 3
• CONS 490 - Integrated Conservation Strategies Credits: 3
• CONS 491 - Comprehensive Conservation Planning Credits: 3
• CONS 497 - Special Topics in Conservation Credits: 1-3
• CONS 498 - Internship Credits: 1-3
• CONS 499 - Independent Study/Research Credits: 1-3
• GGS 303 - Conservation of Resources and Environment Credits: 3
• NCLC 311 - The Mysteries of Migration: Consequences for Conservation Credits: 6
• PRLS 300 - People with Nature Credits: 3
• BIOL 440 - Field Biology Credits: 1-4
• PRLS 402 - Human Behavior in Natural Environments Credits: 3
• additional courses approved by the program coordinator
Total: 24 credits

▲ Concentration in Ecological Science (ECSI)

Students must take 24 credits from the following:

- EVPP 350 - Freshwater Ecosystems Credits: 4
- EVPP 355 - Ecological Engineering and Ecosystem Restoration Credits: 4
- BIOL 309 - Introduction to Oceanography Credits: 3
- BIOL 310 - Biodiversity Credits: 5
- BIOL 345 - Plant Ecology Credits: 4
- BIOL 440 - Field Biology Credits: 1-4
- BIOL 449 - Marine Ecology Credits: 3
- BIOL 459 - Fungi and Ecosystems Credits: 3
- GEOL 305 - Environmental Geology Credits: 3
- GEOL 306 - Soil Science Credits: 3
- additional courses approved by the program coordinator

Total: 24 credits

▲ Concentration in Environmental Health (EVHL)

- EVPP 445 - Principles of Environmental Toxicology Credits: 3
- GCH 205 - International Health Credits: 3
- GCH 360 - Health and Environment Credits: 3
- GGS 302 - Global Environmental Hazards Credits: 3
- GGS 319 - Air Pollution Credits: 3
- GGS 460 - Program Evaluation Credits: 3
- GCH 360 - Health and Environment Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 455 - Environmental Impact Assessment Credits: 3
- GGS 540 - Medical Geography Credits: 3
- CEIE 555 - Introduction to Environmental Engineering Credits: 3
- CHEM 505 - Hazardous Materials Waste Management Credits: 1-3
• additional courses approved by the program coordinator

Total: 24 credits

▲ Concentration in Human and Ecosystem Response to Climate Change (HERC)

• CLIM 101 - Global Warming: Weather, Climate, and Society Credits: 3
• GGS 121 - Dynamic Atmosphere and Hydrosphere Credits: 4
• GGS 302 - Global Environmental Hazards Credits: 3
• EVPP 336 - Human Dimensions of the Environment Credits: 3
and choose either
• GGS 309 - Meteorology and Climate Credits: 3
or
• GGS 314 - Severe and Extreme Weather Credits: 3
Also, select 8 credits from the following:
• BIOL 309 - Introduction to Oceanography Credits: 3
• CLIM 111 - Introduction to the Fundamentals of Atmospheric Science Credits: 3
• CLIM 112 - Introduction to the Fundamentals of Atmospheric Science Lab Credits: 1
• EVPP 355 - Ecological Engineering and Ecosystem Restoration Credits: 4
• EVPP 436 - The Human Dimensions of Global Climate Change Credits: 3
• GGS 304 - Populations Dimensions of Global Change Credits: 3
• GGS 312 - Physical Climatology Credits: 3
• GGS 321 - Biogeography: Space, Time and Life Credits: 3
• GGS 322 - Issues in Global Change Credits: 3
• GGS 353 - Observations of the Earth and its Climate Credits: 3
• GGS 354 - Data Analysis and Global Change Detection Techniques Credits: 3
• additional courses approved by the program coordinator

Total: 24 credits

Bachelor's Level Certificate

Environmental Management Undergraduate Certificate

Banner Code: SC-CERB-EVMG

This undergraduate certificate in environmental management is for students interested in environmental issues. The program consists of a minimum of 27 credits, most of which, with appropriate planning, may be counted toward fulfilling BS or BA requirements in biology, geography, earth science, urban systems engineering, and other natural and social sciences.
The curriculum provides a substantive appreciation of the biological, physical, and social aspects of environmental problems and methods for their analysis and resolution. The program should particularly interest students wishing to pursue graduate work or seeking employment in the environmental field. Inquiries should be made to the director of the environmental management certificate program.

Students receiving the certificate must hold a baccalaureate degree or be earning a baccalaureate degree from Mason at the time they receive the certificate. As an entry-level requirement, students must complete a two-semester laboratory science sequence in environmental science, biology, chemistry, or geology. Only courses with a grade of C or better are counted toward the certificate program. The undergraduate certificate in environmental management may be pursued on a part-time or full-time basis.

Students select at least 27 credits of course work chosen in consultation with the certificate director. The courses are divided into five categories. Courses listed in more than one category can satisfy the requirements of only one. Any substitution in the following list requires permission from the certificate director.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

This program of study is offered by the Department of Environmental Science and Policy in the College of Science.

Certificate Requirements

Environmental certificate core (four courses)

- EVPP 377 or BIOL 377 - Applied Ecology Credits: 3
- GGS 303 - Conservation of Resources and Environment or GGS 503 - Problems in Environmental Management Credits: 3
  one of the following statistics courses
- BIOL 214 - Biostatistics for Biology Majors Credits: 4
- BIOL 312 - Biostatistics Credits: 4
  and one of the following:
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- EVPP 361 - Introduction to Environmental Policy Credits: 3
- EVPP 336 - Human Dimensions of the Environment Credits: 3
- GOVT 351 - Administration in the Political System Credits: 3
- GOVT 357 - Urban Governance and Planning Credits: 3

Physical perspective (one or two courses)

Biology majors are required to complete two courses in physical or social perspective; geology or earth science majors are required to complete two courses in biological or social perspective. Social science majors are required to complete two courses in physical or biological perspective.

- BIOL 309 - Introduction to Oceanography Credits: 3
- BIOL 535 - Ancient Plants and their Environment Credits: 3
- EVPP 550 - Waterscape Ecology and Management Credits: 3
- EVPP 577 - Biogeochemistry: A Global Perspective Credits: 3
- GEOL 305 - Environmental Geology Credits: 3
- GEOL 306 - Soil Science Credits: 3
• GEOL 313 - Hydrogeology Credits: 3
• GEOL 317 - Geomorphology Credits: 4
• GEOL 363 - Coastal Morphology and Processes Credits: 4
• GEOL 403 - Geochemistry Credits: 3
• GEOL 405 - Advanced Seminar in Earth Resources Credits: 3

Biological perspective (one or two courses)

Biology majors are required to complete two courses in physical or social perspective; geology or earth science majors are required to complete two courses in biological or social perspective. Social science majors are required to complete two courses in physical or biological perspective.

• BIOL 309 - Introduction to Oceanography Credits: 3
• BIOL 344 - Plant Diversity and Evolution Credits: 4
• BIOL 345 - Plant Ecology Credits: 4
• BIOL 440 - Field Biology Credits: 1-4
• BIOL 446 - Environmental Physiology Credits: 3
• BIOL 449 - Marine Ecology Credits: 3
• BIOL 471 - Evolution Credits: 3
• BIOL 532 - Animal Behavior Credits: 3
• BIOL 535 - Ancient Plants and their Environment Credits: 3
• BIOL 536 - Ichthyology Credits: 4
• BIOL 537 - Ornithology Credits: 4
• BIOL 543 - Tropical Ecosystems Credits: 4
• BIOL 547 - Terrestrial Plant Ecology Credits: 4
• EVPP 318 - Conservation Biology Credits: 3
• EVPP 350 - Freshwater Ecosystems Credits: 4
• HEAL 450 - Epidemiology and Environmental Health Credits: 3
• EVPP 515 - Molecular Environmental Biology I Credits: 3
• EVPP 538 - Mammalogy Credits: 4
• EVPP 550 - Waterscape Ecology and Management Credits: 3
• EVPP 577 - Biogeochemistry: A Global Perspective Credits: 3

Social perspective (one course)

• ANTH 305 - Foraging Societies Credits: 3
• ANTH 365 - Race and Racism Credits: 3
• ANTH 370 - Environment and Culture Credits: 3
• ANTH 440 - Public Anthropology: Seeking Solutions in the Public and Private Sectors Credits: 3
• CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3
• ECON 350 - Regional and Urban Economics Credits: 3
• ECON 360 - Economics of Developing Areas Credits: 3
• EVPP 336 - Human Dimensions of the Environment Credits: 3
• EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- EVPP 361 - Introduction to Environmental Policy Credits: 3
- GOVT 318 - Interest Groups, Lobbying, and the Political Process Credits: 3
- GOVT 357 - Urban Governance and Planning Credits: 3
- GOVT 364 - Public Policy Making Credits: 3
- GOVT 366 - Public Policy Analysis Credits: 3
- MGMT 312 - Principles and Practices of Management Credits: 3
- PRLS 300 - People with Nature Credits: 3
- PRLS 402 - Human Behavior in Natural Environments Credits: 3
- PRLS 526 - Environmental Education and Resource Interpretation Credits: 3
- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3

Environmental methods (one of the following options)

- BIOL 312 - Biostatistics Credits: 4
- EVPP 305 - Environmental Microbiology Essentials Credits: 3 and EVPP 306 Credits: 1
- EVPP 503 - Field Mapping Techniques Credits: 3
- EVPP 550 - Waterscape Ecology and Management Credits: 3 and EVPP 555 Credits: 1
- EVPP 581 - Estuarine and Coastal Ecology Credits: 3 and EVPP 582 Credits: 1

Total: 27 credits

Undergraduate Minor

Conservation Biology Minor

Banner Code: CBIO

The minor in conservation biology is intended for non-biology majors with an interest in wildlife and habitat conservation issues. The minor may particularly suit Environmental Science, Environmental and Sustainability Studies, Global and Environmental Change majors and Earth Science majors, as well as New Century College students wishing to increase their understanding and qualifications in the field of conservation biology. The minor may also be of interest to non-science majors, for example, students taking leisure studies classes with an interest in ecotourism. This minor may also complement the minor in Applied Conservation Studies which can be taken via the Smithsonian-Mason Semester.

Eight credits of courses must be unique to the minor and not counted toward the student’s major. For policies governing all minors, see the Academic Policies section of this catalog.

This program of study is offered by the Department of Environmental Science and Policy in the College of Science.

Course Work
Candidates for the minor in conservation biology must complete at least 21 credits with a minimum GPA of 2.00, distributed as follows:

**Core Biology Courses (13 credits)**

- BIOL 308 - Foundations of Ecology and Evolution Credits: 5 *
- BIOL 310 - Biodiversity Credits: 5 *
- and one from the following:
- EVPP 318 - Conservation Biology Credits: 3
- BIOL 318 - Conservation Biology Credits: 3
- NCLC 401 - Conservation Biology Credits: 6 (3 of 6 credits count toward minor core. Remaining 3 credits may apply to minor electives)

**Electives (6 credits)**

At least 6 credits of electives from the following courses:

- EVPP 336 - Human Dimensions of the Environment Credits: 3
- EVPP 361 - Introduction to Environmental Policy Credits: 3
- EVPP 377 - Applied Ecology Credits: 3
- EVPP 419 - Marine Mammal Biology and Conservation Credits: 3
- EVPP 420 - Marine Mammal Biology and Conservation Field Course Credits: 1
- EVPP 421 - Marine Conservation Credits: 3
- EVPP 490 - Special Topics in Environmental Science and Policy Credits: 0-4 Conservation Orientated Topics
- NCLC 401 - Conservation Biology Credits: 6 (3 of 6 credits count toward electives if course taken to satisfy core requirement above)
- NCLC 520 - Conservation Education Credits: 3
- NCLC 522 - Developing an Institutional In Situ Conservation Strategy Credits: 3
- TOUR 312 - Ecotourism Credits: 3

**Notes:**

Other conservation-oriented classes may also be applicable as electives for this minor if approved by the faculty coordinator for the minor.

* These courses may have prerequisites that need to be met. See advisor for details.

**Total: 19 credits**

**Environmental Policy Minor**
This program of study is offered by the Department of Environmental Science and Policy in the College of Science.
This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

Course Work

Students must successfully complete 21 credits with a minimum 2.00 GPA. At least 8 credits of courses taken for the minor must be exclusive to the minor and not count toward the student's major. For policies governing all minors, see the Academic Policies section of this catalog.

Core courses (12 credits):

- EVPP 336 - Human Dimensions of the Environment Credits: 3
- EVPP 361 - Introduction to Environmental Policy Credits: 3
- BIOL 377 or EVPP 377 - Applied Ecology Credits: 3
- PHIL 343 - Topics in Environmental Philosophy Credits: 3

Plus 9 credits from the following list:

(or other appropriate courses approved by the coordinator of the minor)

- ANTH 370 - Environment and Culture Credits: 3
- ANTH 399 - Issues in Anthropology Credits: 3
- BIOL 318 or EVPP 318 - Conservation Biology Credits: 3
- BIOL 543 - Tropical Ecosystems Credits: 4
- EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- EVPP 338 - Ecological Economics Credits: 3
- EVPP 419 - Marine Mammal Biology and Conservation Credits: 3
- EVPP 421 - Marine Conservation Credits: 3
- EVPP 490 - Special Topics in Environmental Science and Policy Credits: 0-4 (for example, Conserving Endangered Species, Energy and the Environment, Environmental Science of Puerto Rico)
- EVPP 505 - Selected Topics in Environmental Science Credits: 0-4
- GEOL 420 - Earth Science and Policy Credits: 3
- PRLS 300 - People with Nature Credits: 3
- PRLS 402 - Human Behavior in Natural Environments Credits: 3
- PRLS 526 - Environmental Education and Resource Interpretation Credits: 3
- SOCI 320 - Social Structure and Globalization Credits: 3
- SOCI 332 - The Urban World Credits: 3
- TOUR 312 - Ecotourism Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3
- TOUR 362 - Cultural and Environmental Interpretation Credits: 3
- TOUR 540 - Sustainable Tourism Management Credits: 3
Total: 21 credits

**Environmental Science Minor**

**Banner Code:** EVSC

A minor in environmental science aids the development of an increased awareness of the major environmental issues effecting the natural world and society. The minor is intended to compliment a major in natural science but could also be taken by non-science majors. This minor cannot be taken in conjunction with the BS in Earth Science concentration in environmental geoscience, the BS in Global and Environmental Change, the BS in Environmental Science or the BA in Environmental and Sustainability Studies.

At least 8 credits of courses taken for the minor must be exclusive to the minor and not count toward the student’s major. For policies governing all minors, see the Academic Policies section of this catalog.

This program of study is offered by the Department of Environmental Science and Policy in the College of Science.

**Course Work**

Choose an EVPP or BIOL sequence

- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4
  or
- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 104 - Introductory Biology II Credits: 4
- GEOL 101 - Introductory Geology I Credits: 4

3 credits of applied ecology

- EVPP 377 - Applied Ecology Credits: 3
  or
- BIOL 377 - Applied Ecology Credits: 3

**Electives**

And a minimum of 8 credits of EVPP electives (of which 4 credits must be upper level courses).

**Total: 19-23 credits**
Sustainability Minor

Banner Code: SUST

The core principle of sustainability is the desire to meet the basic material needs of the current generation without compromising the ability of future generations to meet their needs. In order to achieve this goal, we must recognize and address the conflicts and trade-offs involved in balancing environmental integrity, social equity, and economic stability. Such complex work necessarily involves contributions from a wide range of disciplines, and it also requires a re-examination of the relationship between human value systems and cultural practices and the associated long-term implications for the ecosystem.

For policies governing all minors, see the Academic Policies section of this catalog.

This interdisciplinary minor is housed jointly in the Environmental Science and Policy (College of Science) and in the New Century College (College of Humanities and Social Sciences).

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

Course Work

Candidates for the minor in sustainability studies must complete 16 credits, 8 of which must be unique to the minor, with a minimum GPA of 2.00, distributed as follows:

Core Courses (8 credits):

- NCLC 275 - Special Topics Credits: 1-18 (must take 4 credits)
- EVPP 480 - Sustainability in Action Credits: 4

Electives (8 credits):

8 credits of electives are required to complete the minor. A maximum of 2 courses from a single department or program can be counted for elective credit. Preapproved courses are listed here and others may be substituted (see the program coordinator for further information).

- ANTH 370 - Environment and Culture Credits: 3
- CEIE 355 - Environmental Engineering and Science Credits: 3
- CEIE 450 - Environmental Engineering Systems Credits: 3
- CHEM 155 - Introduction to Environmental Chemistry I Credits: 4
- ECON 335 - Environmental Economics Credits: 3
- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 201 - Environment and You: Issues for the Twenty-First Century Credits: 3
- EVPP 335 - People, Plants, and Culture Credits: 3
- EVPP 336 - Human Dimensions of the Environment Credits: 3
- EVPP 337 - Environmental Policy Making in Developing Countries Credits: 3
- EVPP 361 - Introduction to Environmental Policy Credits: 3
- EVPP 421 - Marine Conservation Credits: 3
- GEOL 305 - Environmental Geology Credits: 3
- NCLC 220 - Energy and Environment Credits: 3-6
- PRLS 250 - Wilderness Travel and Sustainability Credits: 2
- PRLS 300 - People with Nature Credits: 3
- PRLS 402 - Human Behavior in Natural Environments Credits: 3
- PRLS 501 - Introduction to Natural Resources Law Credits: 3
- PHIL 343 - Topics in Environmental Philosophy Credits: 3
- SOCI 320 - Social Structure and Globalization Credits: 3
- TOUR 312 - Ecotourism Credits: 3
- TOUR 340 - Sustainable Tourism Credits: 3
- USST 301 - Urban Growth in a Shrinking World Credits: 3

Total: 16 credits

Master's Degree

Environmental Science and Policy, MS

Banner Code: SC-MS-EVSP

The MS in environmental science and policy meets the increasing need for trained environmental professionals who can address the problems of land and water management, land use and urbanization, wetland loss, microbial ecology, bioremediation, conservation biology, and ecosystem preservation. These professionals will also contribute to the analysis and resolution of global problems, such as deforestation, insufficient world food supplies, acid deposition, population growth and public health, global climate change/warming, and depletion of the stratospheric ozone. Areas of specific departmental focus include ecosystems; conservation; environmental biocomplexity; molecular ecology; sustainability science; environmental policy and management and human/environmental interactions.

Environmental problems are defined in the real world and do not necessarily conform to traditional academic disciplines. As such, solutions require creative combinations of diverse interests and subjects. Effective training requires rigorous, problem-focused interdisciplinary action in a setting in which research is an essential element supporting instruction.

Five concentrations are available in the master's program: environmental science and policy, conservation science and policy, environmental biocomplexity, Earth surface processes and environmental geochemistry, and environmental management. The first four concentrations, designed for students who wish to obtain a research oriented master's degree, serve as a training ground for students wishing to further their education by pursuing the PhD in environmental science and public policy at Mason or doctoral programs at other universities. The environmental science and policy concentration is the largest and serves as a home for a broad array of research foci. The conservation science and policy concentration is designed to be an interdisciplinary, research-oriented degree focusing on the conservation of threatened species and habitats, integrating biological sciences and the human dimensions of conservation practice. The environmental biocomplexity concentration is designed for students who wish to obtain a research-oriented master's degree in population genetics, microbial ecology, and molecular systematics. The concentration in Earth surface processes and environmental geochemistry provides a specific research focus in the Earth science area.

The environmental management concentration serves as a terminal professional master’s degree for individuals working in or aspiring to work as managers in the environmental field in government or private industry. It combines the managerial and administrative skills developed in a traditional master of public administration degree program with the scientific knowledge and understanding normally found in a master of science degree.

This program of study is offered by the Department of Environmental Science and Policy in the College of Science.
This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

**Admission Requirements**

Applicants must complete a standard Mason graduate application form, available from the Graduate Admissions Office or on line at admissions.gmu.edu. Applicants should hold a bachelor’s degree with a GPA of 3.00 in natural or Earth sciences, engineering, resource planning, environmental studies, or a related field with an environmental focus from an accredited institution. Applicants should have taken at least two semesters of chemistry and three semesters of biology, including a course in ecology. Applicants should submit three letters of recommendation, including at least one from a former professor or, if not available, from someone with a PhD. The aptitude portion of the GRE is required, and successful applicants usually have achieved a minimum score of 1,100 for verbal and quantitative combined. Applicants must also submit a statement of interest to the program, which should include the concentration to which they are applying, potential areas of environmental focus, research option preferred, a statement of interactions with potential faculty advisors, and an explanation of career goals. Prospective students must contact potential faculty advisors appropriate to their interests during the application process. The availability of an advisor in the student’s area of interest is a prerequisite for final admission. Students will choose their research skills option at the time of application but may change this option later with their advisor’s permission.

Applicants who lack college level course work in biology and chemistry should contact the ESP graduate coordinator's office for advice. Successful completion of a two semester sequence of introductory graduate level environmental chemistry and biology courses would be sufficient background to prepare students without academic training in the natural sciences. These introductory courses would be in addition to the degree requirements listed below.

**Degree Requirements**

Students will complete 33-37 credits of a concentration according to requirements described below to earn the master's degree in environmental science and policy concentration. Students must form a supervisory committee and submit a program of study to the graduate coordinator for approval within the first 9 credits of course work or by the end of second semester, whichever comes first. The supervisory committee consists of the advisor and at least two other members, chosen in consultation with the advisor and conforming to Mason policy on master’s thesis committees. Course requirements may be fulfilled by completing courses from a variety of academic units at Mason. The program requires a minimum of 33 graduate credits distributed in four categories to provide a breadth of knowledge appropriate for addressing current environmental issues. Course selection should reflect a coherent individual program focus, which is stated and briefly described in the program of study, and support the research component of the student’s degree program.

Course selection should also support the research component of the student’s degree program and should be developed in close consultation with the advisor and committee members. The advisor and thesis committee approve the course work program individually for each student.

For the concentration in environmental management, there is no supervisory committee. The graduate program director serves as the advisor for these students.

▲ **Conservation Science and Policy Concentration (COSP)**

This concentration is for students desiring an MS degree with an interdisciplinary approach to the conservation of species and habitats. Students may take courses offered by ESP and other departments on the Fairfax campus as well as CONS courses which are offered through the Smithsonian Mason Global Conservation Studies Program. This unique partnership with the Smithsonian Conservation Biology Institute in Front Royal, Virginia offers students hand-on education in cutting-edge conservation science and human dimensions through residential, intensive classes. SCBI is renowned for its conservation research and training of conservation practitioners around the world and instructors for these classes are drawn from SCBI’s conservation scientists and other experts from around the world.
Requirements may be fulfilled by completing courses from a variety of academic units at Mason. The program requires a minimum of 33 graduate credits distributed in five categories and provide a breadth of knowledge appropriate for addressing current conservation issues. Course selection should support the research component of the student's degree program developed in close consultation with the advisor and the committee members. The advisor and thesis committee approve the course work program individually for each student.

**Conservation Science (6 credits)**

At least 6 credits are required from conservation science courses. Suggested courses include:

- CONS 630 - Species Monitoring & Conservation Credits: 3 (variable topics, may be taken more than once if different topic)
- EVPP 518 - Conservation Biology Credits: 3
- EVPP 519 - Marine Mammal Biology and Conservation Credits: 3
- EVPP 543 - Tropical Ecosystems Credits: 4
- EVPP 550 - Waterscape Ecology and Management Credits: 3
- EVPP 621 - Overview of Biodiversity Conservation Credits: 3

**Conservation Policy and Human Dimensions of Conservation (6 credits)**

At least 6 credits are required in conservation policy or social courses. Suggested courses include:

- CONS 660 - Effective Conservation Leadership Credits: 3
- CONS 665 - Conservation Conflict Resolution Credits: 3
- EVPP 521 - Marine Conservation Credits: 3
- EVPP 622 - Management of Wild Living Resources Credits: 3
- EVPP 642 - Environmental Policy Credits: 3

**Conservation Methods (6 credits)**

At least 6 credits are required in relevant experimental methods, statistics or conservation techniques courses. Suggested courses include:

- CONS 620 - Spatial Ecology, Geospatial Analysis & Remote Sensing for Conservation Credits: 3
- CONS 625 - Statistics for Ecology and Conservation Biology Credits: 3
- EVPP 555 - Lab in Waterscape Ecology Credits: 1

**Seminar (1 credit)**

At least 1 credit on an appropriate topic is required.

- EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1

**Research (1-6 credits)**
This requirement may be satisfied in one of two ways. Students may conduct a project (EVPP 798) or produce a formal thesis (EVPP 799). The depth and sophistication of the research differs between the two options. The thesis normally involves original research with independent acquisition and interpretation of data, with the goal of peer-reviewed publication. Projects are generally less extensive and can include a broader range of activities.

Students fulfilling the research with EVPP 798 are required to take a comprehensive exam administered by their committee. Students choosing to do a thesis and completing EVPP 799 will present their results in a public seminar and defend their thesis before their committee. Students will be graded pass/no credit on the research skills component.

- EVPP 798 - Master's Research Project in Environmental Science and Public Policy Credits: 1-3
  or
- At least 3 credits of EVPP 799 - Master's Thesis in Environmental Science and Public Policy Credits: 1-6

**Electives**

If necessary, students take additional, relevant, electives to bring the total to 33 credits.

**Total: 33 credits**

▲ **Earth Surface Processes and Environmental Geochemistry Concentration (ESEG)**

This concentration provides a specific research focus in the earth science area and is designed for students desiring an MS degree with an earth science geology theme.

Requirements may be fulfilled by completing courses from a variety of academic units at Mason. The program requires a minimum of 33 graduate credits distributed in the categories below. Course selection should support the research component of the student's degree program developed in close consultation with the advisor and the committee members. The advisor and thesis committee approve the course work program individually for each student.

**Natural Sciences (16 credits)**

- Students select at least one course (totaling 10 of the 16 required credits) from each of the following areas: soils science, hydrogeology, and geochemistry.

The remaining courses (6 credits) may be chosen from a list of applicable EVPP, CHEM, and GEOL graduate courses, including:

- GEOL 500 - Selected Topics in Modern Geology Credits: 1-3
- GEOL 501 - Selected Topics in Modern Geology Credits: 1-3
- GEOL 601 - The Lithosphere Credits: 3
- CHEM 633 - Chemical Thermodynamics and Kinetics Credits: 3
- CHEM 651 - Environmental Chemistry of Organic Substances Credits: 3
- CHEM 728 - Introduction to Solid Surfaces Credits: 3
- EVPP 503 - Field Mapping Techniques Credits: 3
- EVPP 505 - Selected Topics in Environmental Science Credits: 0-4
- EVPP 543 - Tropical Ecosystems Credits: 4
- EVPP 550 - Waterscape Ecology and Management Credits: 3
- EVPP 563 - Coastal Morphology and Processes Credits: 4
• EVPP 577 - Biogeochemistry: A Global Perspective Credits: 3
• EVPP 607 - Fundamentals of Ecology Credits: 3
• EVPP 610 - Bioremediation: Theory and Applications Credits: 3
• EVPP 643 - Microbial Ecology Credits: 4
• EVPP 745 - Environmental Toxicology Credits: 3

Public Policy (6 credits)

• At least 6 credits are required in environmental law, human dimension of global change, environmental ethics, human ecology, or planning.

Methods (6 credits)

• At least 6 credits are required in remote sensing, GIS, statistics, instrumentation, or modeling.

Seminar (1 credit)

At least 1 credit on an appropriate topic is required.

• EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1

Research (3 credits)

At least 3 credits of master's thesis are required for this concentration. Students present their results in a public seminar and defend their thesis before their committee. Students will be graded satisfactory/no credit (S/NC) on the research component.

• EVPP 799 - Master's Thesis in Environmental Science and Public Policy Credits: 1-6

Electives

• If necessary, students take additional electives to bring the total to 33 credits.

Total: 33 credits

▲ Environmental Biocomplexity Concentration (EVBC)

The environmental biocomplexity concentration is designed for students desiring an MS degree with an environmental biocomplexity theme who wish to obtain a research-oriented master's degree in population genetics, microbial ecology, and molecular systematics.

Requirements may be fulfilled by completing courses from a variety of academic units at Mason. The program requires a minimum of 33 graduate credits distributed in the categories below. Course selection should support the research component of the student's degree program developed in close consultation with the advisor and the committee members. The advisor and thesis committee approve the course work program individually for each student.
Students are encouraged to complete at least 1 credit of directed studies (EVPP 693) as a lab rotation to broaden the scope of their experience in the concentration.

**Natural Sciences (6 credits)**

- At least 6 credits are required in courses that cover ecology, biogeochemistry, biochemistry, population genetics, molecular biology, molecular systematics, molecular evolution, microbial ecology, microbial diversity, quantitative genetics, and population biology.

**Public Policy (6 credits)**

- At least 6 credits are required in environmental law, human ecology, environmental ethics, patent law, and legal and ethical issues in science.

**Methods and Statistics (9 credits)**

- At least 9 credits are required in statistics, bioinformatics, information systems, instrumental analysis, microbiological techniques, molecular methods, and phylogenetic methods.

**Seminar (1 credit)**

At least 1 credit on an appropriate topic is required.

- EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1

**Research (1-6 credits):**

This requirement may be satisfied in one of two ways. Students may conduct a project (EVPP 798) or produce a formal thesis (EVPP 799). The depth and sophistication of the research differs between the two options. The thesis normally involves original research with independent acquisition and interpretation of data, with the goal of peer-reviewed publication. Projects are generally less extensive and can include a broader range of activities. Students will be graded satisfactory/no credit (S/NC) on the research skills component.

**Project Option**

Students fulfilling the research requirement with EVPP 798 are required to take a comprehensive exam administered by their committee

- At least 1 credit of EVPP 798 - Master's Research Project in Environmental Science and Public Policy Credits: 1-3

**Thesis Option**

Students choosing to do a thesis and completing EVPP 799 will present their results in a public seminar and defend their thesis before their committee.

- At least 3 credits of EVPP 799 - Master's Thesis in Environmental Science and Public Policy Credits: 1-6
Electives

- If necessary, students take additional electives to bring the total to 33 credits.

Total: 33 credits

▲ Environmental Management Concentration (EVMG)

The environmental management concentration combines the managerial and administrative skills developed in a traditional master of public administration degree program with the scientific knowledge and understanding normally found in a master of science degree.

Students must complete 37 credits for the environmental management concentration. Students in this concentration will be assigned an advisor upon admission. Full-time students can complete this degree in three semesters; part-time students take six semesters. Course work must include the following:

Core Courses (18-19 credits)

- EVPP 638 - Corporate Environmental Management and Policy Credits: 3
- EVPP 641 - Environmental Science and Public Policy Credits: 3
- EVPP 642 - Environmental Policy Credits: 3
- PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3
- PUAD 540 - Public Policy Process Credits: 3
- and one of the following methods courses:
  - PUAD 511 - Problem Solving and Data Analysis I Credits: 3
  - EVPP 650 - Environmental Analysis and Modeling Credits: 4
  - GGS 550 - Geospatial Science Fundamentals Credits: 3
  - GGS 553 - Geographic Information System Credits: 3
  - GGS 579 - Remote Sensing Credits: 3
  - SOCI 636 - Statistical Reasoning Credits: 3

Environmental Law (3 credits)

At least 3 credits are required, chosen from the following:

- EVPP 670 - Environmental Law Credits: 3
- CEIE 556 - Environmental Law Credits: 3
- PRLS 501 - Introduction to Natural Resources Law Credits: 3

Field Ecology (4 credits)

At least 4 credits are required, chosen from the following:
• EVPP 550 - Waterscape Ecology and Management Credits: 3
• EVPP 555 - Lab in Waterscape Ecology Credits: 1
or
• EVPP 646 - Wetland Ecology and Management Credits: 3
• EVPP 647 - Wetland Ecology Lab and Field Credits: 1
• or other approved 4 credit field ecology course

Capstone (3 credits)

• EVPP 677 - Applied Ecology and Ecosystem Management. Credits: 3

Electives (9 credits)

Students may choose 9 credits (or more) to complete 37 credits from the following list of approved electives. Other courses may be used subject to approval of the Graduate Program Director.

• EVPP 607 - Fundamentals of Ecology Credits: 3 (must be taken if student has not previously taken a course in ecology)
• EVPP 524 - Introduction to Environmental and Resource Economics Credits: 3
• EVPP 525 - Economics of Human/Environment Interactions Credits: 3
• EVPP 550 - Waterscape Ecology and Management Credits: 3
• EVPP 620 - Development of U.S. Environmental Policies Credits: 3
• EVPP 621 - Overview of Biodiversity Conservation Credits: 3
• EVPP 622 - Management of Wild Living Resources Credits: 3
• EVPP 626 - Environment and Development in Asia Credits: 3
• EVPP 627 - Environmental Policy in Latin America Credits: 3
• EVPP 628 - Environment and Development in Africa Credits: 3
• EVPP 630 - Methods and Logic of Social Inquiry Credits: 3
• EVPP 635 - Environment and Society Credits: 3
• EVPP 638 - Corporate Environmental Management and Policy Credits: 3
• EVPP 646 - Wetland Ecology and Management Credits: 3
• EVPP 650 - Environmental Analysis and Modeling Credits: 4
• EVPP 675 - Environmental Planning and Administration Credits: 3
• CLIM 690 - Scientific Basis of Climate Change Credits: 3
• GGS 550 - Geospatial Science Fundamentals Credits: 3 (only if not taken as part of the core courses above)
• PUAD 509 - Justice Organizations and Processes Credits: 3
• PUAD 615 - Administrative Law Credits: 3
• PUAD 622 - Program Planning and Implementation Credits: 3
• PUAD 645 - Policy Analysis Credits: 3
• PUAD 646 - Program Evaluation Credits: 3
• PUAD 657 - Association Management Credits: 3
• PUAD 729 - Issues in Public Management Credits: 3
• MBA 623 - Marketing Management Credits: 3
• MBA 712 - Project Management Credits: 3
• MBA 724 - Marketing Communications Credits: 3
Total: 37 credits

▲ Environmental Science and Policy Concentration (EVSP)

The environmental science and policy concentration is a home for a broad array of research foci. It encourages an independent and creative approach to the development of curricula that reside in the general field of environmental science and policy.

Requirements may be fulfilled by completing courses from a variety of academic units at Mason. The program requires a minimum of 33 graduate credits distributed in the categories below and provide a breadth of knowledge appropriate for addressing current environmental policy issues. Course selection should support the research component of the student's degree program developed in close consultation with the advisor and the committee members. The advisor and thesis committee approve the course work program individually for each student.

Course selection should also support the research component of the student’s degree program and should be developed in close consultation with the advisor and committee members. The advisor and thesis committee approve the course work program individually for each student.

Natural Sciences (6 credits)

- At least 6 credits are required in biology, geology, geography, chemistry, or environmental engineering.
  EVPP 607 - Fundamentals of Ecology Credits: 3 is required for those students without previous course work in ecology and can be included within the 6 credits.

Public Policy (6 credits)

- At least 6 credits are required in environmental law, human ecology, environmental ethics, planning, or public affairs.

Methods and Statistics (9 credits)

- At least 9 credits are required in statistics, remote sensing, information systems, instrumental analysis, or modeling. A course in statistics is highly recommended.

Seminar (1 credit)

At least 1 credit on an appropriate topic is required.

- EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1

Research (1-6 credits)

This requirement may be satisfied in one of two ways. Students may conduct a project (EVPP 798) or produce a formal thesis (EVPP 799). The depth and sophistication of the research differs between the two options. The thesis normally involves original research with independent acquisition and interpretation of data, with the goal of peer-reviewed publication. Projects are
generally less extensive and can include a broader range of activities. Students will be graded satisfactory/no credit (S/NC) on the research skills component.

**Project Option**

Students fulfilling the research requirement with EVPP 798 are required to take a comprehensive exam administered by their committee.

- At least 1 credit of EVPP 798 - Master's Research Project in Environmental Science and Public Policy Credits: 1-3

**Thesis Option**

Students choosing to do a thesis and completing EVPP 799 will present their results in a public seminar and defend their thesis before their committee.

- At least 3 credits of EVPP 799 - Master's Thesis in Environmental Science and Public Policy Credits: 1-6

**Electives**

- If necessary, students take additional electives to bring the total to 33 credits.

**Total: 33 credits**

**Total: 33-37 credits**

**Master's Level Certificate**

**Environmental Management Graduate Certificate**

**Banner Code: SC-CERG-EVMG**

The graduate certificate allows students to expand their knowledge of the environment and environmental management beyond their undergraduate training. It offers a professional credential to students who might not have the time or background to enroll in a graduate degree program requiring a thesis or dissertation. Students who later obtain admission to the graduate degree programs in environmental science and policy may be able to use credits earned during the certificate toward their graduate degree program.

The curriculum provides a substantive exposure to the biological, physical, and social aspects of environmental problems, and methods for their analysis and resolution.

This program of study is offered by the Department of Environmental Science and Policy in the College of Science.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.
**Admission**

Applicants who lack college level course work in biology and chemistry should contact the ESP graduate coordinator's office for advice. Successful completion of a two semester sequence of introductory graduate level environmental chemistry and biology courses would be sufficient background to prepare students without academic training in the natural sciences.

Applicants to the program should meet the following minimum requirements:

- Undergraduate (baccalaureate) degree, preferably in biology, chemistry, geology, geography, earth systems science, resource planning, environmental studies, or a related discipline with an environmental focus.
- Two semesters of college level general chemistry with a laboratory (see note above regarding introductory graduate environmental chemistry).
- Two semesters of college level general biology with a laboratory (see note above regarding introductory graduate environmental biology).
- Undergraduate course in general ecology; students who do not meet this requirement must take EVPP 677 - Applied Ecology and Ecosystem Management, as their natural science elective.
- Three letters of reference and a statement of interest in the program.
- Aptitude portion of the Graduate Record Exam.

**Certificate Requirements**

The certificate is awarded after satisfactory completion of six graduate courses (a minimum of 18 credits) as specified below:

**Environmental certificate core (three courses, 9 credits):**

- EVPP 677 - Applied Ecology and Ecosystem Management. Credits: 3

**Two of the following:**

- EVPP 641 - Environmental Science and Public Policy Credits: 3
- EVPP 675 - Environmental Planning and Administration Credits: 3
- SOCI 635 - Environment and Society Credits: 3

**Three electives (10-11 credits):**

Choose one course from each of the following areas:

**Natural Sciences:**

- EVPP 550 - Waterscape Ecology and Management Credits: 3
- EVPP 577 - Biogeochemistry: A Global Perspective Credits: 3
- EVPP 607 - Fundamentals of Ecology Credits: 3
• EVPP 643 - Microbial Ecology Credits: 4
• EVPP 645 - Freshwater Ecology Credits: 3
• EVPP 646 - Wetland Ecology and Management Credits: 3
• EVPP 745 - Environmental Toxicology Credits: 3

Social Sciences:

• CONF 501 - Introduction to Conflict Analysis and Resolution Credits: 3
• EVPP 635 - Environment and Society Credits: 3
• EVPP 638 - Corporate Environmental Management and Policy Credits: 3
• EVPP 641 - Environmental Science and Public Policy Credits: 3
• EVPP 642 - Environmental Policy Credits: 3
• EVPP 670 - Environmental Law Credits: 3
• EVPP 675 - Environmental Planning and Administration Credits: 3
• PRLS 501 - Introduction to Natural Resources Law Credits: 3
• PRLS 526 - Environmental Education and Resource Interpretation Credits: 3
• PHIL 643 - Environmental Ethics Credits: 3
• PUAD 502 - Administration in Public and Nonprofit Organizations Credits: 3

Environmental Methods:

• EVPP 650 - Environmental Analysis and Modeling Credits: 4

Total: 18-19 credits

Doctoral Degree

Environmental Science and Public Policy, PhD

Banner Code: SC-PHD-EVPP

This interdisciplinary program draws on faculty and expertise from the Environmental Science and Policy departmental core faculty, as well as faculty from across the university. This includes the Departments of Atmospheric, Oceanic and Earth Sciences; Molecular and Microbiology; Public and International Affairs; Chemistry and Biochemistry; Economics; Geography and Geoinformation Science; and Sociology and Anthropology; as well as the School of Public Policy, the Volgenau School of Information Technology and Engineering, and the College of Education and Human Development.

Our graduates contribute to the solution of complex environmental problems, which require the development of knowledge and skills in the collection, analysis, and interpretation of scientific data, as well as in the integration of scientific understanding into the public policy process.

This program of study is offered by the Department of Environmental Science and Policy in the College of Science.
Admission Requirements

Applicants should have a bachelor’s degree with an overall GPA of at least 3.00. They should have taken at least two semesters of chemistry and three semesters of biology, including a course in ecology. The application deadline is February 15 for admission to fall semester; admission to spring semester is usually not available.

In addition to the materials required of all applicants for graduate study at Mason, applicants should submit the following:

- Scores on aptitude portion of GRE
- Three letters of recommendation, with at least two from individuals with doctorates.
- Current résumé.
- Substantial statement of interest that includes a description of the specific area of proposed dissertation research, the potential focus (environmental science or environmental public policy), contacts that have been made with potential faculty advisors, and an explanation of career and research goals.

All students must obtain the consent of a faculty member willing to serve as an advisor prior to being fully admitted to the program. Admission decisions are based on the student’s qualifications and the availability of a faculty advisor. An advisor may be changed by mutual consent of student and advisor, or petition to the graduate program director and the Associate Dean for Student and Academic Affairs in the College of Science. Applicants with questions should contact the ESP Graduate Services office (703-993-3187).

Science and Ecology Background

Applicants who lack college level course work in biology and chemistry will be expected to complete a two semester sequence of introductory graduate level environmental chemistry and biology courses as follows:

- EVPP 506 - Science of the Environment I Credits: 3
- EVPP 507 - Science of the Environment II Credits: 3

These introductory courses will add six credits to the degree requirements listed below and cannot be added to the graduate program of study.

Students without previous coursework in general ecology will be required to take the following introductory course, which may be included in the graduate program of study.

- EVPP 607 - Fundamentals of Ecology Credits: 3

Reduction of Credit

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

Degree Requirements

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

The doctoral program requires a minimum of 78 graduate credits beyond the bachelor’s degree. Students with a master’s degree in an appropriate field may obtain a reduction of credit for appropriate course work of up to 30 graduate credits.
Doctoral Course Work (54-66 credits)

Students are required to complete a course work proposal by the end of the second semester of courses. The coursework proposal must be approved by the advisor and program director. In keeping with the general philosophy inherent in a PhD degree, students adopt an individual program that focuses on a specific area of research. The students’ course work must provide the knowledge base from which original research projects in their specific areas of interest can be successfully completed.

To ensure that all students obtain the necessary skills and knowledge to function as environmental professionals, the program requires all students to fulfill the following four category course requirements:

Natural Sciences (12 credits)

- At least 12 credits are required in biology, chemistry, environmental science, geology, geography, or environmental engineering.

Public Policy (12 credits)

- At least 12 credits are required in public affairs, economics, sociology, and business. A course in environmental law is also required as part of this category.

Research Methods and Technology (9 credits)

- At least 9 credits are required in statistics, remote sensing, geographic information systems, analytical chemistry, modeling, or information technology. Students should carefully choose course work to ensure they have the necessary skills to support dissertation research.

Doctoral Seminar (4 credits):

Students must present a total of 4 graduate seminar credits, with EVPP 991 taken at least once.

- EVPP 692 - Master's Seminar in Environmental Science and Public Policy Credits: 1
- EVPP 991 - Advanced Seminar in Environmental Science Credits: 2

Course Work Focus (12 credits):

- Beyond the basic 12 hour natural science/public policy requirements, a student's program of study will emphasize either environmental science or environmental public policy. Students focusing on environmental science should take another 12 credits (for a total of 24 credits) in natural science; those focusing on environmental public policy should take another 12 credits (for a total of 24 credits) of public policy course work. Previous thesis research courses may not be applied to this degree. See advisor for further details.

Electives (5-17 credits)

If necessary, students take additional electives to bring the total number of credits to 78

Dissertation Committee
Before the end of the fourth semester of course work, in consultation with their advisor, the student forms a Dissertation Committee of at least four members. Three of the committee members must be from the George Mason graduate faculty, with representation from at least two academic units. The Dissertation Committee must be approved by the Dean of the College of Science.

Program of Study

After reviewing the student’s course work proposal, progress to date, and area of research, the committee makes final recommendations concerning course work that will be codified in the Program of Study to be signed by all committee members and the Graduate Program Director. Students are advised to work closely with their advisor and committee to develop the course work program in order to facilitate the process of course selection. During the duration of graduate study, a student must meet with the full Dissertation Committee at least once a year.

Qualifying Exams

On completion of all or nearly all course work, students may request to take the qualifying or candidacy exam. The qualifying exam has both written and oral components. The written portion consists of questions submitted by each member of the Dissertation Committee. Successful completion of the written exam should be followed by the oral portion within one month. The qualifying exam may be repeated once at the discretion of the student’s committee.

Advancement to Candidacy

Upon approval of the Program of Study, completion of all or nearly all course work, successful completion of the qualifying exam, and the approval of the Dissertation Proposal, the student is recommended for advancement to candidacy by the Graduate Program Director. Students must advance to candidacy within six years of admission to the program.

Dissertation Research (12-24 credits)

Students must complete a dissertation (12 to 24 credits). This may be accomplished by taking EVPP 999 (Doctoral Dissertation) alone, or in combination with EVPP 998 (Doctoral Dissertation Proposal). However, no more than half the credits specified for dissertation credit on the student’s program of study may be taken as EVPP 998. Students working on dissertation research must register for a minimum of 3 credits of 999 per semester (excluding summers) until they have completed the minimum number of dissertation research credits. Then, they must register for 1 credit of 999 until the dissertation is complete and has been officially submitted to the library.

The dissertation is an original written work, demonstrating mastery of subject matter, methodologies, and conceptual foundations, on a specific problem in the general field of environmental science and public policy. The dissertation generally involves collection and analysis of original data or the substantially new analysis and reinterpretation of existing data.

- EVPP 998 - Doctoral Dissertation Proposal Credits: 1-6 (maximum of 12 credits)
- EVPP 999 - Doctoral Dissertation Research Credits: 1-12

Dissertation Research and Defense

Before students may enroll in dissertation research (EVPP 999), they must have advanced to candidacy and have a dissertation proposal approved by the Dissertation Committee, Graduate Program Director, Department Chairperson, and Dean of the College. Students must present the completed dissertation in a public seminar and defend the work before the dissertation committee. Awarding of the degree is contingent on approval of the dissertation by the Dissertation Committee, Graduate Program Director, Department Chairperson, and Dean. The dissertation and defense must be completed within five years of advancement to candidacy.
The Forensic Science Program is an interdisciplinary academic collaboration between the Department of Chemistry and Biochemistry and the School of Systems Biology (SSB). In addition, the Program has its own dedicated teaching faculty. The Program is administered by the Forensic Science Program Director, and governed by an interdepartmental Forensic Science Program Committee.

Course Work

The program offers all course work designated FSRC in the Courses chapter of this catalog.

Undergraduate Degree Programs

The Forensic Science Program oversees the BS and the undergraduate minor in Forensic Science.

Graduate Degree Programs

The Forensic Science Program oversees the MS and Graduate Certificate programs in Forensic Science.

Undergraduate Degree

Forensic Science, BS

Banner Code: SC-BS-FRSC

Students planning professional careers in the field of forensic science should choose this degree.
Students must fulfill all requirements for bachelor's degrees including university general education requirements. In addition, students majoring in forensic science must complete the following courses with a minimum GPA of 2.30. No more than two courses with a grade of D (1.00) may be applied to the major. Through course work below, students satisfy the university-wide requirements in natural science and quantitative reasoning.

FRSC 302 and 304 will satisfy this major's writing-intensive requirement.

This program of study is offered by the Forensic Science Program in the College of Science.

Degree Requirements

Forensic science core courses (21 credits)

- FRSC 200 - Survey of Forensic Science Credits: 3
- FRSC 201 - Introduction to Criminalistics Credits: 3
- FRSC 302 - Forensic Bio-Trace Credits: 3
- FRSC 303 - Forensic Evidence and Ethics Credits: 3
- FRSC 304 - Forensic Chemistry and Microscopy Credits: 3
- FRSC 405 - Independent Studies / Research Credits: 3
- CRIM 100 - Introduction to Criminal Justice Credits: 3

Natural science core courses (45-46 credits)

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 318 - Organic Chemistry Lab II Credits: 2
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- or
- STAT 250 - Introductory Statistics I Credits: 3
- BIOL 214 - Biostatistics for Biology Majors Credits: 4

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 430 - Advanced Human Anatomy and Physiology I Credits: 4
- BIOL 431 - Advanced Human Anatomy and Physiology II Credits: 4
Additional courses (8 credits)

Select courses from:

- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 311 - General Genetics Credits: 4
- CHEM 321 - Elementary Quantitative Analysis Credits: 4
- CHEM 422 - Instrumental Analysis Credits: 3
- CHEM 423 - Instrumental Analysis Laboratory Credits: 2
- CHEM 463 - General Biochemistry I Credits: 4

Undergraduate Minor

Forensic Science Minor

Banner Code: FRSC

The minor in forensic science addresses the growing national and regional interest in forensics by introducing students to the technical, psychological, and legal aspects of the field. The minor provides an attractive option for students with majors in the natural sciences, engineering, or computer science, and the curriculum structure makes it particularly suitable for students with majors in biology and chemistry.

At least 8 credits must be applied only to this minor and may not be used to fulfill requirements of the student’s major, concentration, or another minor or undergraduate certificate. Students must complete at least 6 credits in their minor at Mason and achieve a minimum GPA of 2.00 in courses applied to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

The minor in forensic science consists of 20 credits of course work.

This program of study is offered by the Forensic Science Program in the College of Science.

Course Work

Foundation Science Courses (8 credits from the following):

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
  and
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
• PHYS 160 - University Physics I Credits: 3
  and
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 243 - College Physics Credits: 3
  and
• PHYS 244 - College Physics Lab Credits: 1
• PHYS 245 - College Physics Credits: 3
  and
• PHYS 246 - College Physics Lab Credits: 1
• PHYS 260 - University Physics II Credits: 3
  and
• PHYS 261 - University Physics II Laboratory Credits: 1

Forensic Science Courses (9 credits)

• FRSC 200 - Survey of Forensic Science Credits: 3
• FRSC 201 - Introduction to Criminalistics Credits: 3
• FRSC 302 - Forensic Bio-Trace Credits: 3

Supporting Courses (3 credits from the following):

• FRSC 303 - Forensic Evidence and Ethics Credits: 3
• FRSC 304 - Forensic Chemistry and Microscopy Credits: 3
• CRIM 400 - Applied Criminal Psychology Credits: 3
• PSYC 231 - Social Psychology Credits: 3

Total: 20 credits

Master's Degree

Forensic Science, MS

Banner Code: SC-MS-FRSC
The interdisciplinary MS program in Forensic Science is designed to train students in the technical and legal aspects of the field, and it is especially relevant for the many area professionals holding positions in government and private laboratories specializing in the analytical investigation of criminal and terrorist activities. Graduates will be qualified to work in high-technology forensics laboratories that analyze and interpret a wide variety of evidence and data in support of investigations and prosecutions. The demand for graduates with these skills is especially strong in the Northern VA region, where several new FBI and police forensics labs are being built or expanded.

Students enrolled in this professional MS program are charged at a differential (premium) tuition rate, and therefore they may not enroll concurrently in any other graduate degree program or certificate program offered by COS, with the exception of the graduate certificate program in Forensics. However students enrolled in academic programs outside COS may enroll in this certificate program concurrently.

This program of study is offered by the Forensic Science Program in the College of Science.

**Admission Requirements**

Applicants to the Forensic Science MS program should hold a BA or BS degree in a related field from an accredited university with a minimum GPA of 3.00. Applicants should submit the a completed GMU graduate application, three letters of recommendation, two copies of official transcripts from each institution of higher learning attended, a current resume, a Virginia Domicile Classification form, and an official report of TOEFL (foreign nationals only).

**Degree Requirements**

The MS program in Forensic Science requires a total of 33 credit hours, comprising traditional 3-credit lecture courses (many with laboratory components), a seminar course, and a research project or thesis. The coursework is divided into forensics core courses and forensics electives. Students must complete 18 credits of core courses and 12 credits of forensic science electives, in addition to a 3 credit research project or thesis.

An important element of the program is the “Forensics Capstone Course,” in which students combine their skills as members of multidisciplinary investigation teams in order to analyze “real world” crime scenes. This course will demonstrate in practice how students combine skills in the scientific/quantitative analysis and legal/anthropological areas to understand the nuances of the evidence presented at an actual crime scene. Waivers of specific course requirements will be considered for students who have taken equivalent courses elsewhere or have substantial practical experience in the subject areas covered by the particular course. Students complete 33 credits as follows:

**Forensics Core Courses (18 credits):**

- FRSC 500 - Introduction to Forensic Science Credits: 3
- FRSC 510 - Basic Crime Analysis Credits: 3
- FRSC 530 - Law and Forensic Science Credits: 3
- FRSC 600 - Forensics Seminar Credits: 1 (taken 3 times)
- FRSC 690 - Forensics Capstone Course Credits: 3
- FRSC 540 - Forensic Chemistry Credits: 3
  or
- FRSC 570 - Introduction to Biochemical Forensics Credits: 3
Forensics Electives (12 credits):

12 credits selected from the following:

- FRSC 511 - Advanced Crime Scene Analysis Credits: 3
- FRSC 512 - Physical Evidence Analysis Credits: 3
- FRSC 513 - Forensic Photography Credits: 3
- FRSC 520 - Toxicology Credits: 3
- FRSC 550 - Issues in Forensic Anthropology Credits: 3
- FRSC 560 - Forensic DNA Sciences Credits: 3
- FRSC 580 - Image Analysis in Forensic Science Credits: 3
- FRSC 790 - Internship in Forensic Science Credits: 1-3
- BIOL 510 - Forensic DNA Analysis Laboratory Credits: 1
- SOCI 607 - Criminology Credits: 3

Research Component (3 credits):

Students complete either a 3 credit research project or a 3 credit thesis:

- FRSC 610 - Forensics Research Project Credits: 1-3
- FRSC 799 - Master's Thesis Credits: 1-6

Total: 33 credits

Master's Level Certificate

Forensics Graduate Certificate

Banner Code: SC-CERG-FORS

This interdisciplinary graduate certificate program is designed for students seeking training in forensic science, as well as for current professionals employed by the federal government, local law enforcement, and private security corporations. Forensics refers to the application of scientific methodologies to the analysis of crime scenes, the collection of evidence, and the laboratory analysis of that evidence in support of criminal investigations. Related legal aspects are also considered as part of a comprehensive approach to forensics.

Students enrolled in the forensic science concentration obtain the specific scientific skills necessary for laboratory employment in the field. Students enrolled in the general forensics concentration obtain a more general background in the field with a focus on criminal law and anthropology.

At the time of completion, depending on the concentration, students will be able to

- Understand the basic principles of forensics.
Perform a general crime scene analysis.
Develop DNA profiles and interpret results of toxicological studies.
Apply fundamental legal and anthropological concepts.
Work collaboratively in interdisciplinary groups.

This program of study is offered by the Forensic Science Program in the College of Science.

The graduate certificate in forensic science may be pursued on a part-time or full-time basis.

Admission Requirements

Applicants to the forensic science concentration should hold a BA or BS degree in biology or chemistry from an accredited university with a minimum GPA of 3.00. Applicants to the general forensics concentration should hold a BA or BS degree from an accredited university with a minimum GPA of 3.00. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, and a current résumé to the Department of Chemistry Graduate Admissions Processing Center. TOEFL scores are required of all international applicants. Students may not pursue this certificate concurrently with any other graduate degree program or certificate program offered by COS because this certificate program will charge students at a differential (premium) tuition rate. However, students enrolled in academic programs outside COS may enroll in this certificate program concurrently.

Certificate Requirements

The certificate in forensics requires a total of 18 credits, comprising six 3-credit courses. A unique element of the program is the Forensics Capstone Course, which is shared by the two concentrations. In this class, students from the two concentrations will combine their skills as members of interdisciplinary investigation teams as they analyze a real-world crime scene. The curriculum requirements for each concentration are listed below:

- **FRSC 500 - Introduction to Forensic Science** Credits: 3
- **FRSC 510 - Basic Crime Analysis** Credits: 3

▲ Forensic Science Concentration (FRSC)

Required Courses (12 credits):

- **FRSC 520 - Toxicology** Credits: 3
- **FRSC 540 - Forensic Chemistry** Credits: 3

- **FRSC 560 - Forensic DNA Sciences** Credits: 3
  or
  **BINF 637 - Forensic DNA Sciences** Credits: 3

- **FRSC 690 - Forensics Capstone Course** Credits: 3
Total: 18 credits

▲ General Forensics Concentration (FRSG)

Required Courses (12 credits):

- FRSC 530 - Law and Forensic Science Credits: 3
- FRSC 550 - Issues in Forensic Anthropology Credits: 3
- FRSC 570 - Introduction to Biochemical Forensics Credits: 3
- FRSC 690 - Forensics Capstone Course Credits: 3

Total: 18 credits

■ Geography and Geoinformation Science

Phone: 703-993-1210 or 703-993-1212
Web: ggs.gmu.edu

Faculty

Professors: Agouris (Chair), Beach, Di, Falconer, Haack, Taylor, Waters, Wong

Associate professors: Curtin, Houser, Qu, Stefanidis, C. Yang, R. Yang

Assistant professors: Cervone, Croitoru, Leslie, Manca, Medina, Rice, Sun

Research or contract professors: Franzese, Resmini

Term instructors: Boudinot, Hallden

Course Work

This department offers all courses designated GGS in the Courses chapter of this catalog.

Writing-Intensive Requirement
The university requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in geography fulfill this requirement by successfully completing GGS 415. Students majoring in global and environmental change fulfill this requirement by successfully completing GGS 304.

Teacher Licensure

Students who wish to become teachers should consult the College of Education and Human Development chapter and attend an information session early in their undergraduate career. For more information, call 703-993-2892, e-mail gseadmit@gmu.edu, or go to gse.gmu.edu.

PhD Studies in Other Programs

The department participates in other programs that provide opportunities for geographical, environmental, and earth science research. A popular example is the Environmental Science and Public Policy PhD Program where faculty members serve as both dissertation committee members and chairs. Geographic studies fit well with many issues related to public policy, planning, conservation, and sustainable development. Program description and degree regulations are listed under the Department of Environmental Science and Policy.

The department also participates in the Public Policy PhD Program, along with some of the university’s leading geographers who are members of the School of Public Policy. In addition, geography and geoinformation science faculty members provide joint supervision and serve as committee members to support those pursuing research primarily geographic in nature. Program description and degree regulations can be found under the School of Public Policy listing. Several departments participate in supervisory committees providing a rich opportunity for students to expand their interdisciplinary interests with these departments.

Undergraduate Degree

Geography, BA

Banner Code: SC-BA-GEOG

Students must fulfill all requirements for bachelor’s degrees, including university general education requirements. Students majoring in geography must complete additional college requirements for the BA degree in COS. Candidates for a degree in geography must also complete 28 credits of approved GGS geography courses with a minimum GPA of 2.00 in addition to 18 credits of electives.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

Degree Requirements

Core courses (16 credits):

- GGS 102 - Physical Geography Credits: 3
- GGS 103 - Human Geography Credits: 3
- GGS 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GGS 310 - Introduction to Digital Cartography Credits: 4
• GGS 415 - Seminar in Geography Credits: 3

Systematics, regional and applications courses (12 credits):

Choose four courses from the following lists. One must be from system, one from regional and any two others which may be taken from any list below:

**Systematic Courses** (one course must be taken from the following)

- GGS 301 - Political Geography Credits: 3
- GGS 302 - Global Environmental Hazards Credits: 3
- GGS 303 - Conservation of Resources and Environment Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 305 - Economic Geography Credits: 3
- GGS 306 - Urban Geography Credits: 3
- GGS 307 - Sustainable Development Credits: 3
- GGS 309 - Meteorology and Climate Credits: 3
- GGS 312 - Physical Climatology Credits: 3
- GGS 314 - Severe and Extreme Weather Credits: 3
- GGS 319 - Air Pollution Credits: 3
- GGS 321 - Biogeography: Space, Time and Life Credits: 3
- GGS 322 - Issues in Global Change Credits: 3
- GGS 357 - Structures in Urban Governance and Planning Credits: 3
- GGS 406 - Suburban Geography Credits: 3
- GGS 420 - Physiography of North America Credits: 1 to 3
- GGS 455 - Introduction to Atmospheric Radiation Credits: 3

**Regional Courses** (one course must be taken from the following)

- GGS 315 - Geography of the United States Credits: 3
- GGS 316 - Geography of Latin America Credits: 3
- GGS 325 - Geography of North Africa and the Middle East Credits: 3
- GGS 330 - Geography of the Soviet Succession States Credits: 3
- GGS 333 - Issues in Regional Geography Credits: 3
- GGS 380 - Geography of Virginia Credits: 3

**Applications Courses** (remaining two courses may be taken from the following)

- GGS 110 - Maps and Mapping Credits: 3
- GGS 308 - Field Mapping Techniques Credits: 3
- GGS 311 - Introduction to Geographic Information Systems Credits: 3
- GGS 313 - GIS Applications for Earth Systems Credits: 3
- GGS 353 - Observations of the Earth and its Climate Credits: 3
- GGS 354 - Data Analysis and Global Change Detection Techniques Credits: 3
- GGS 410 - Introduction to Hyperspectral Imaging Credits: 3
- GGS 411 - Advanced Digital Cartography Credits: 3
- GGS 412 - Air Photography Interpretation Credits: 3
- GGS 416 - Satellite Image Analysis Credits: 3
- GGS 463 - Applied Geographic Information Systems Credits: 3
- GGS 480 - Internship in Geography Credits: 1 to 3
- GGS 490 - Practicum in Geographical Applications Credits: 1-3
Electives (at least 18 credits):

- 18 or more credits consisting of an approved double major, disciplinary minor, interdisciplinary minor, or certificate, or any other coherent 18-credit (minimum) package of courses approved by the advisor and the department chair. No more than 7 credits used to meet the 28-credit requirement may be used to meet this requirement. Some of these courses may fulfill university-wide general education or college-level requirements.

Geography, BS

Banner Code: SC-BS-GEOG

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, candidates for a BS degree in geography must complete the following with a minimum GPA of 2.00 in the 46 credits of geography courses in the first group.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

Degree Requirements

46 credits in geography, including:

16 credits of core courses:

- GGS 102 - Physical Geography Credits: 3
- GGS 103 - Human Geography Credits: 3
- GGS 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GGS 310 - Introduction to Digital Cartography Credits: 4
- GGS 415 - Seminar in Geography Credits: 3

12 credits of systematic and regional courses, chosen from:

Choose four courses from the following, including at least one systematic geography and one regional geography course. Some of the regional courses fulfill the college-level, non-Western culture requirement:

**Systematic Courses** (one course from the following must be taken)

- GGS 301 - Political Geography Credits: 3
- GGS 302 - Global Environmental Hazards Credits: 3
- GGS 303 - Conservation of Resources and Environment Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 305 - Economic Geography Credits: 3
- GGS 306 - Urban Geography Credits: 3
- GGS 307 - Sustainable Development Credits: 3
- GGS 309 - Meteorology and Climate Credits: 3
- GGS 312 - Physical Climatology Credits: 3
• GGS 314 - Severe and Extreme Weather Credits: 3
• GGS 319 - Air Pollution Credits: 3
• GGS 321 - Biogeography: Space, Time and Life Credits: 3
• GGS 322 - Issues in Global Change Credits: 3
• GGS 357 - Structures in Urban Governance and Planning Credits: 3
• GGS 406 - Suburban Geography Credits: 3
• GGS 420 - Physiography of North America Credits: 1 to 3
• GGS 455 - Environmental Impact Assessment Credits: 3
• GGS 456 - Introduction to Atmospheric Radiation Credits: 3

Regional Courses (one course from the following must be taken)
• GGS 315 - Geography of the United States Credits: 3
• GGS 316 - Geography of Latin America Credits: 3
• GGS 320 - Geography of Europe Credits: 3
• GGS 325 - Geography of North Africa and the Middle East Credits: 3
• GGS 330 - Geography of the Soviet Succession States Credits: 3
• GGS 333 - Issues in Regional Geography Credits: 3
• GGS 380 - Geography of Virginia Credits: 3

12 credits of applications courses:

• GGS 311 - Introduction to Geographic Information Systems Credits: 3
• GGS 411 - Advanced Digital Cartography Credits: 3
• GGS 412 - Air Photography Interpretation Credits: 3
  and one of the following two courses:
• GGS 416 - Satellite Image Analysis Credits: 3
  or
• GGS 463 - Applied Geographic Information Systems Credits: 3

6 credits of electives:

• 6 additional credits of geography electives, which may also include an internship (GGS 480) approved by the program advisor before enrollment

25 or 26 credits of required science, mathematics, statistics, and computer science courses:

• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• STAT 250 - Introductory Statistics I Credits: 3
  and one of the following:
• IT 103 - Introduction to Computing Credits: 3
  or
• CDS 130 - Computing for Scientists Credits: 3
  plus either a GEOL sequence:
Global and Environmental Change, BS

Banner Code: SC-BS-GLEC

This interdisciplinary undergraduate program, one of the first of its kind in the nation, distinguishes itself from other degrees in the natural sciences in that it examines from local, regional, and global scales the dynamics of Earth’s systems and their interactions: the geosphere, the atmosphere, the ecosphere, and the sociosphere. In addition, it emphasizes the dynamic and changing Earth systems and the use of Earth observing and remote sensing and related geoinformation technologies in detecting changes. It is jointly offered with the Department of Environmental Science and Policy (esp.gmu.edu).

In meeting the requirements for this major, students choose a focus in environmental change (i.e. impacts of sea level rise on the Chesapeake Bay) or global change (i.e. global causes of sea level and detection).

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. Through the course work listed below, global and environmental change majors satisfy university-wide general education requirements in natural science, quantitative reasoning, information technology, global understanding, social science, and synthesis.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

Degree Requirements

Two required ecosphere core courses (8 credits):

students take either the GGS sequence:

- GGS 121 - Dynamic Atmosphere and Hydrosphere Credits: 4
- GGS 122 - Dynamic Geosphere and Ecosphere Credits: 4

or the EVPP sequence:

- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4
- EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4

Four required core courses in global and environmental change (12-13 credits):

- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 353 - Observations of the Earth and its Climate Credits: 3

- GGS 302 - Global Environmental Hazards Credits: 3
  or
- GEOL 305 - Environmental Geology Credits: 3
• GGS 300 - Quantitative Methods for Geographical Analysis Credits: 3
  or
• BIOL 312 - Biostatistics Credits: 4

Four required courses in geosphere and atmosphere (13-15 credits):

students take either
• GEOL 101 - Introductory Geology I Credits: 4
  or the sequence
• PHYS 243 - College Physics Credits: 3
• PHYS 244 - College Physics Lab Credits: 1

plus 3 courses from:

• GGS 309 - Meteorology and Climate Credits: 3
• GGS 312 - Physical Climatology Credits: 3
• GGS 314 - Severe and Extreme Weather Credits: 3
• GGS 319 - Air Pollution Credits: 3
• GGS 399 - Selected Topics in Geography Credits: 3
• GEOL 306 - Soil Science Credits: 3
• GEOL 309 - Introduction to Oceanography Credits: 3
• GEOL 317 - Geomorphology Credits: 4
• EVPP 490 - Special Topics in Environmental Science and Policy Credits: 0-4

Four required courses in ecosphere and sociosphere (12-13 credits):

students take one of these two courses
• EVPP 377 - Applied Ecology Credits: 3
• GGS 321 - Biogeography: Space, Time and Life Credits: 3
  plus one of these three courses:
• GGS 101 - Major World Regions Credits: 3
• GLOA 101 - Introduction to Global Affairs Credits: 3
• CEIE 100 - Environmental Engineering around the World Credits: 3
  and one of these two courses:
• GGS 103 - Human Geography Credits: 3
• ANTH 135 - Becoming Human: Evolution, Cognition, and Culture Credits: 3
  and one course from this list:
• BIOL 318 - Conservation Biology Credits: 3
• BIOL 345 - Plant Ecology Credits: 4
• BIOL 449 - Marine Ecology Credits: 3
• GGS 303 - Conservation of Resources and Environment Credits: 3
• GGS 307 - Sustainable Development Credits: 3
• GGS 322 - Issues in Global Change Credits: 3
Two required courses in applications and techniques of detecting global change, choose two from (6 credits):

- GGS 311 - Introduction to Geographic Information Systems Credits: 3
- GGS 313 - GIS Applications for Earth Systems Credits: 3
- GGS 354 - Data Analysis and Global Change Detection Techniques Credits: 3
- GGS 410 - Introduction to Hyperspectral Imaging Credits: 3
- GGS 455 - Environmental Impact Assessment Credits: 3
- GGS 495 - Senior Research in Global and Environmental Change Credits: 3
- GGS 412 - Air Photography Interpretation Credits: 3
- GGS 416 - Satellite Image Analysis Credits: 3
- GGS 463 - Applied Geographic Information Systems Credits: 3
- GEOL 303 - Field Mapping Techniques Credits: 3

Two required supporting sciences sequence courses beyond general education requirements (8 credits):

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
  or
- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1
  or
- ASTR 111 - Introductory Astronomy: The Solar System Credits: 3
- ASTR 112 - Introductory Astronomy Lab: The Solar System Credits: 1
- ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3
- ASTR 114 - Introductory Astronomy Lab: Stars, Galaxies, and the Universe Credits: 1
  or
- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4
  or
- BIOL 103 - Introductory Biology I Credits: 4
- BIOL 104 - Introductory Biology II Credits: 4

Four required supporting mathematics and IT courses (14 credits):

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• STAT 250 - Introductory Statistics I Credits: 3
• IT 103 - Introduction to Computing Credits: 3

General electives

• General electives (27–31)

Undergraduate Minor

Geographic Information Systems Minor

Banner Code: GIS

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

To receive this minor, students must complete 18 or 19 credits in geography beyond the prerequisite of GGS 102 or 103, 8 of which must be unique to the minor, with a minimum GPA of 2.00:

Four required courses (12 credits):

• GGS 110 - Maps and Mapping Credits: 3
• GGS 300 - Quantitative Methods for Geographical Analysis Credits: 3
• GGS 311 - Introduction to Geographic Information Systems Credits: 3
• GGS 463 - Applied Geographic Information Systems Credits: 3

Two elective courses chosen from (6–7 credits):

• GGS 310 - Introduction to Digital Cartography Credits: 4
• GGS 411 - Advanced Digital Cartography Credits: 3
• GGS 412 - Air Photography Interpretation Credits: 3
• GGS 416 - Satellite Image Analysis Credits: 3

Note:

With departmental permission, one course with significant geographic information systems (GIS) content may be substituted for one of the above.
Total: 18-19 credits

Geography Minor

Banner Code: GEOG

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

For policies governing all minors, see the Academic Policies section of this catalog.

Course Work

To receive the minor, students must complete 18 credits in geography, 8 credits of which must be unique to the minor, with a minimum GPA of 2.00, distributed as follows:

Two core courses (6 credits):

- GGS 102 - Physical Geography Credits: 3
  and either
- GGS 101 - Major World Regions Credits: 3
  or
- GGS 103 - Human Geography Credits: 3

Four additional courses (12 credits):

Students choose four classes at the 300 and 400 level: one course in systematic geography, one course in regional geography, and two additional courses from either list below.

Systematic
- GGS 301 - Political Geography Credits: 3
- GGS 303 - Conservation of Resources and Environment Credits: 3
- GGS 304 - Populations Dimensions of Global Change Credits: 3
- GGS 305 - Economic Geography Credits: 3
- GGS 306 - Urban Geography Credits: 3
- GGS 309 - Meteorology and Climate Credits: 3

Regional
- GGS 315 - Geography of the United States Credits: 3
- GGS 316 - Geography of Latin America Credits: 3
- GGS 320 - Geography of Europe Credits: 3
- GGS 325 - Geography of North Africa and the Middle East Credits: 3
- GGS 330 - Geography of the Soviet Succession States Credits: 3
- GGS 333 - Issues in Regional Geography Credits: 3
- GGS 380 - Geography of Virginia Credits: 3
Master's Degree

Earth Systems Science, MS

Banner Code: SC-MS-ESSC

This interdisciplinary master’s program is offered jointly by the Department of Geography and Geoinformation Science and the Department of Environmental Science and Policy. The program addresses the growing demand for trained professionals in Earth systems science and applications. The degree emphasizes a research-oriented, global systems approach to studying the atmosphere, hydrosphere, and lithosphere, including their interrelationships and interactions with the biosphere. Emphasis is on the observation and quantitative analysis of Earth systems. Students completing the program are qualified to pursue careers that require knowledge of the basics of Earth systems science and the requisite tools. Students are encouraged to undertake an optional master’s thesis for more in-depth studies or a research project. In the latter case, students must pass a comprehensive exam.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

Admission Requirements

Applicants should have a BS degree in Earth, environmental, or physical science. Previous course work should include two semesters each of calculus, chemistry, and physics, and one semester of statistics. They should have a minimum GPA of 3.00 in their undergraduate degree. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, a current résumé, and an expanded goals statement to the COS Graduate Admissions Processing Center. Applicants should also include three letters of recommendation and an official report of scores obtained on the GRE-GEN. The GRE-SUB is recommended if it is given in the student’s undergraduate major. The GRE requirement will be waived if the student holds a master’s degree from a U.S. institution. TOEFL scores are required of all foreign applicants.

Degree Requirements

Candidates must successfully complete 30 credits as follows:

9 credits of Earth science core:

select one course from each group:

- CSI 655 or PHYS 575 - Atmospheric Physics I Credits: 3
- GGS 656 or EVPP 652 - The Hydrosphere Credits: 3
- GGS 657 or GEOL 601 - The Lithosphere Credits: 3

3 credits of Earth observation courses:
• GGS 579 - Remote Sensing Credits: 3

3 credits of quantitative techniques courses:

select one course from the following:

• CSI 654 - Data and Data Systems in the Physical Sciences Credits: 3
• GGS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
• GGS 560 - Quantitative Methods Credits: 3

3 credits of human and biological perspectives courses:

select one course from the following:

• GGS 575 - Reconstructing Past Environments: Seminar in Geoarchaeology Credits: 3
• GGS 704 - Spatial Analysis and Modeling of Population Credits: 3
• GGS 721 - Biogeography Credits: 3
• EVPP 577 - Biogeochemistry: A Global Perspective Credits: 3
• EVPP 636 - Gender, Race, and the Natural World Credits: 3

3 credits of colloquium/seminar:

• GGS 792 - Seminar in Earth Systems Science Credits: 2
• GGS 900 - Colloquium Earth Systems Sciences Credits: 1

3–6 credits of research:

• GGS 798 - Research Project in Earth Systems Science Credits: 1-6
  or
• GGS 799 - Thesis Credits: 1-6

General electives

• 3-6 credits of general electives

Total: 30 credits

Geographic and Cartographic Sciences, MS

Banner Code: SC-MS-GECA
The focus of this program is to prepare students for careers in geography, remote sensing, and GIS and its increasing applications in diverse fields, as well as cartography, visualization, and modeling. This expertise is useful to civil and defense federal agencies, state and local government agencies, private corporations, and educational institutions. Courses concentrate on the techniques of compilation, display and analysis of spatial data, and their applications. Students are also encouraged to select internships as part of their program. More than 400 of our alumni from this program have entered employment in the Washington, D.C., area since 1978.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

Research Facilities

The department’s laboratories house SUN workstations, PCs, and Macs with multiple input and output devices to support ArcGIS, ArcMap, ArcView, IDRISI, ERDAS, and other cartography, GIS, and image-processing software packages. In addition, the department houses an extensive collection of spatial data in different formats. Enriching the program is a network of alumni, students, guest lecturers, and adjunct faculty who work in geography-related organizations in the greater Washington, D.C., area. Specialized instructional space for geographic information science is housed in Innovation Hall on the Fairfax Campus. The department also is home to the Center of Excellence in GIS.

Admission Requirements

In addition to meeting all admission requirements for graduate study at Mason, applicants should have a bachelor’s degree in geography, cartography, or equivalent. Applicants without an undergraduate degree in geography may be required to take one course in each of the following: physical geography, human geography, and cartography. All applicants must have a course in statistics. The program also requires GRE aptitude scores, three letters of recommendation, transcripts of all college course work, and a statement of interest in the degree. The GRE requirement will be waived if the student holds a master’s degree from a regionally accredited U.S. institution. TOEFL scores are required for all foreign applicants. Credit from courses taken at other departments and other universities may be applied to the program with prior approval.

Dual Degree Program with the University of Cagliari and the University of London

The Geographic Information Science for Environmental and Spatial Planning (GISESP) is a transatlantic program with three institutions: George Mason University, the University of Cagliari in Italy and the University of London in the United Kingdom. The program will provide students with the opportunity to experience an integrated program of study in the area of geographic information science (GIS) and environmental planning support science. GISESP is funded by the EACEA through the Atlantis Program. GISESP provides students with a dual degree master's graduate program that will last two years and be based upon successful completion of 48 US credits, equivalent to 144 EU credits leading to the following two degrees: an MS in Geographic and Cartographic Science from George Mason and the II level Master Degree in Geographic Information and Environmental Planning Support from UniCA, Italy. For more information on this program, please visit: http://people.unica.it/giesp/

Degree Requirements

Students must complete either 36 graduate credits (without a thesis) or 30 graduate credits (including 3-6 credits of thesis). If the nonthesis option is selected, students are required to pass a comprehensive exam.

Core Courses (12 credits)
• GGS 553 - Geographic Information System Credits: 3
• GGS 579 - Remote Sensing Credits: 3
• GGS 560 - Quantitative Methods Credits: 3
• GGS 689 - Seminar in Geographic Thought and Methodology Credits: 3

Thesis Option (18 credits)

Students selecting the thesis option must complete 3–6 credits of thesis and 12–15 credits of electives

• 3–6 credits of GGS 799 - Thesis Credits: 1-6
• 12–15 credits of electives from 500-799 GGS courses

Nonthesis Option (24 credits)

Students selecting the nonthesis option must pass a comprehensive exam and complete 24 credits of electives

• Comprehensive exam
• 24 credits of electives from 500-799 GGS courses

Note:

Electives should be selected in consultation with an advisor. With departmental approval, up to 9 credits from closely related disciplines may be applied to the degree.

Total: 30 or 36 credits

Geoinformatics and Geospatial Intelligence, MS

Banner Code: SC-MS-GEOI

The new MS program in geoinformatics and geospatial intelligence addresses the emerging demand for scientists trained in the collection, organization, analysis, and dissemination of information about physical features, man-made structures, moving objects, people, and events that are geo-referenced or geo-located. This program focuses primarily on the computational approaches that support the synthesis and analysis of diverse types of data, in order to identify and monitor complex events and phenomena that manifest themselves over space and time. While geospatial intelligence has a strong Department of Defense connotation, the principles behind it have a significant dual use potential, addressing the needs of a broader audience, ranging for example from intelligent navigation in urban spaces to emergency response systems for natural and man-made disasters.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

The MS program in geoinformatics and geospatial intelligence is designed to expose students to fundamental theoretical principles and practical applications involving:

• Geographic Information Science
• Digital image analysis as it applies to geoinformatics and geospatial intelligence
Computational principles for geoinformatics and intelligence

The curriculum structure of the program reflects these three educational components. The GEOI MS degree requires a minimum of 33 credits, including a 3-credit MS thesis.

Admission Requirements

Applicants to the MS program in geoinformatics and geospatial intelligence should hold a BA or BS degree in a discipline related to the program’s theme from an accredited university, with a minimum GPA of 3.00, including courses in differential and integral calculus. A working knowledge of a computer programming language is a plus. When the background of an individual student does not meet the program’s requirements, remedial or preparatory courses tailored to student’s needs may be recommended. Applicants must submit a completed GMU graduate application, along with official transcripts, resume, VA domicile classification form (when applicable), official GRE score reports, and TOEFL scores if they are foreign nationals.

Degree Requirements

The GEOI MS degree requires 33 credit hours, comprising 10 courses plus a 3-credit MS thesis. The courses include 7 mandatory core courses and 3 electives to be selected from a list of offerings (and approved by the program coordinator).

Core Courses (21 credits):

- GGS 550 - Geospatial Science Fundamentals Credits: 3
- GGS 553 - Geographic Information System Credits: 3
- GGS 664 - Spatial Data Structures Credits: 3
- GGS 684 - Selected Topics in Geospatial Intelligence Credits: 3
- GGS 685 - Capstone Course in Geoinformatics Credits: 3
- GGS 680 - Earth Image Processing Credits: 3
- GGS 787 - Scientific Data Mining for Geoinformatics Credits: 3

Thesis (3 credits):

- GGS 799 - Thesis Credits: 1-6 (3 credits)

Electives (9 credits):

Students select three courses from the groups below, with no more than two from a single group (i.e. courses are taken from at least two groups):

Image Analysis:

- GGS 579 - Remote Sensing Credits: 3
- GGS 740 - Hyperspectral Imaging Systems Credits: 3
- GGS 759 - Topics in Earth Systems Science Credits: 1-6
- GGS 760 - Advanced Topics in Remote Sensing Credits: 3
Geographic Information Science (GIS):

- GGS 631 - Spatial Agent-Based Models of Human-Environment Interactions Credits: 3
- GGS 653 - Geographic Information Analysis Credits: 3
- GGS 671 - Algorithms and Modeling in GIS Credits: 3
- GGS 772 - Distributed Geographic Information Systems Credits: 3
- GGS 791 - Advanced Spatial Statistics Credits: 3
- GGS 795 - Seminar in Regional Analysis Credits: 3

Computational Geoinformatics:

- GGS 650 - Introduction to GIS Algorithms and Programming Credits: 3
- GGS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
- GGS 671 - Algorithms and Modeling in GIS Credits: 3
- GGS 773 - Interoperability of Geographic Information Systems Credits: 3

Total: 33 credits

Master's Level Certificate

Geographic Information Sciences Graduate Certificate

Banner Code: SC-CERG-GISC

This graduate certificate prepares students for employment in federal, state, and local government positions that require GIS skills. Graduates have typically been employed in major mapping programs of the Department of the Interior and in the related land management agencies at the federal and state level. The certificate has been found suitable for the needs of business and industry, including those corporations that serve as contractors to governments in the United States and overseas.

This professional certificate program charges students at a differential (premium) tuition rate. This rate applies to all students who enroll in this certificate program, regardless of in-state or out-of-state status. The differential tuition will be used to fund continuing improvements in the departmental computational facilities used to support the certificate program.

The graduate certificate in Geographic Information Sciences may be pursued on a part-time or full-time basis.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

Admission Requirements

Applicants should submit an application for graduate studies and must meet all requirements for graduate study at Mason. All applicants should have a working knowledge of, or prior education or training in, computer technology. Knowledge of GIS, remote sensing technology, and cartography are preferred. Students from any discipline are welcome to apply, but students with a
background in one of the physical sciences (atmospheric science, hydrology, or geology), geography, environmental science, or engineering are particularly well-suited to undertake this program.

Students with no knowledge of geospatial technology are required to take the following course prior to admission to the program: GGS 550 - Geospatial Science Fundamentals

Certificate Requirements

Students must successfully complete 15 graduate credits, distributed as follows:

9 credits of required core courses:

- GGS 653 - Geographic Information Analysis Credits: 3
- plus one course from this group:
  - GGS 553 - Geographic Information System Credits: 3
  - CEIE 510 - Geographic Information Systems in Engineering Credits: 3
- and one course from this group:
  - GGS 563 - Advanced Geographic Information Systems Credits: 3
  - GGS 671 - Algorithms and Modeling in GIS Credits: 3

6 credits of electives chosen from:

- GGS 531 - Land-Use Modeling Techniques and Applications Credits: 3
- GGS 655 - Map Design Credits: 3
- GGS 664 - Spatial Data Structures Credits: 3
- GGS 772 - Distributed Geographic Information Systems Credits: 3
- GGS 773 - Interoperability of Geographic Information Systems Credits: 3
- CEIE 685 - Civil Engineering Information Management Credits: 3
- INFS 614 - Database Management Credits: 3
- INFS 755 - Data Mining Credits: 3

Note:

Other courses may be used as electives with prior written approval of the department.

Total: 15 credits

Geospatial Intelligence Graduate Certificate

Banner Code: SC-CERG-GI
This graduate certificate program is for persons employed in geospatial intelligence applications (i.e., federal agency and/or corporate or association personnel) or those interested in entering this field. Our program offers fundamental knowledge on geospatial intelligence and the ability to apply this knowledge to a diverse range of constantly evolving geospatial intelligence situations.

This professional certificate program charges students at a differential (premium) tuition rate. This rate applies to all students who enroll in this certificate program, regardless of in-state or out-of-state status. The differential tuition will be used to fund continuing improvements in the departmental computational facilities used to support the certificate program.

The graduate certificate in Geospatial Intelligence may be pursued on a part-time or full-time basis.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

**Admission Requirements**

Applicants to this graduate certificate program should hold a BA or BS degree in a discipline related to the certificate’s theme from an accredited university with a minimum GPA of 3.00. Applicants must submit a completed Mason graduate application, along with official transcripts, résumé, Virginia domicile classification form, and TOEFL scores if they are foreign nationals. GRE scores and letters of recommendation are not required but will considerably strengthen an application, if available.

Applicants should have undergraduate backgrounds that include courses in differential and integral calculus, and they should possess working knowledge of a computer programming language. Depending on the background of the individual student, the coordinator may recommend remedial or preparatory courses tailored to the student’s needs. Students may not pursue this certificate concurrent with any other graduate degree programs or certificates offered by COS (because this certificate will charge students a differential tuition rate). However, students enrolled in academic programs outside COS may enroll in this certificate program concurrently. Students may transfer no more than 3 credits into the certificate program with the approval of the academic director.

**Certificate Requirements**

The Geospatial Intelligence (GI) certificate requires a total of 18 credits, or 6 courses. These comprise five mandatory core courses and one elective. The mandatory core courses reflect the three key science emphases areas of this program, namely geospatial image analysis, spatial analysis, and information technology, as reflected in the following list of mandatory core courses:

- GGS 553 - Geographic Information System Credits: 3
- GGS 680 - Earth Image Processing Credits: 3
- GGS 684 - Selected Topics in Geospatial Intelligence Credits: 3
- GGS 685 - Capstone Course in Geoinformatics Credits: 3
- INFS 519 - Program Design and Data Structures Credits: 3
- one 3-credit elective selected in consultation with advisor

**Total: 18 credits**

**Remote Sensing and Earth Image Processing Graduate Certificate**

**Banner Code: SC-CERG-RSIP**
The certificate program focuses on the skills needed to take advantage of the enormous increase in the availability and use of remotely sensed data related to the Earth. The program requires students to complete 15 credits of GGS graduate courses. Ideal candidates for this certificate are those who have a background in Earth and environmental sciences and are working in or planning to enter into the field of remote sensing, Earth observing, or image processing.

This professional certificate program charges students at a differential (premium) tuition rate. This rate applies to all students who enroll in this certificate program, regardless of in-state or out-of-state status. The differential tuition will be used to fund continuing improvements in the departmental computational facilities used to support the certificate program.

The graduate certificate in remote sensing and earth image processing may only be pursued on a part-time basis.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

**Admission Requirements**

Applicants should hold a BA or BS degree in a discipline related to the science and applications of remote sensing from an accredited university, with a minimum GPA of 3.00. Applicants should have some prior education or training in remote sensing or image processing. Students with a background in one of the physical sciences (physics, chemistry, atmospheric science, hydrology, or geology), geography, or environmental science will be particularly well-suited to undertake this program. Applicants should have an undergraduate background that includes courses in differential and integral calculus, and they should possess working knowledge of a computer programming language. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, and a current résumé to the COS Graduate Admissions Processing Center. TOEFL scores are required of all international applicants.

**Certificate Requirements**

**Required Core Courses (9 credits):**

- GGS 579 - Remote Sensing Credits: 3
- GGS 680 - Earth Image Processing Credits: 3
- GGS 740 - Hyperspectral Imaging Systems Credits: 3

**Elective Courses (6 credits):**

Choose two courses from the following:

- GGS 562 - Photogrammetry Credits: 3
- GGS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
- GGS 756 - Physical Principles of Remote Sensing Credits: 3
- GGS 760 - Advanced Topics in Remote Sensing Credits: 3
- GGS 840 - Hyperspectral Imaging Applications Credits: 3

**Total: 15 credits**
Doctoral Degree

Earth Systems and Geoinformation Sciences, PhD

Banner Code: SC-PHD-ESGS

The innovative PhD in Earth Systems and Geoinformation Sciences program (ESGS) is based on the integration of the scientific disciplines in geosystems, geosciences, and geography, with the two slightly more technology-oriented scientific disciplines in geoinformation sciences: remote sensing, and geographic information systems (GIS). Graduates from the ESGS doctoral program will be qualified to serve as lead scientists in a wide range of activities involving geosciences, geography, GIS, and remote sensing.

The continual expansion of the NASA Earth observation satellite constellation, the development and expansion of the spatial data infrastructure at federal agencies, and the need to analyze these Earth-oriented data to achieve environmental and economic objectives ensure a constant need in the foreseeable future for qualified scientists in these fields. Students receive broad-based training in the geosciences and geography, as well as concentrated courses in computation and geoinformation sciences.

The ESGS doctoral program represents a gateway to an academic career for some students; for others, it facilitates career advancement in the public sector or private industry. Graduates are equipped to participate in interdisciplinary research, which is the norm in today’s research arena. In addition, students also receive training in teaching, qualifying them to join academic units in more traditional disciplinary and instruction oriented settings or in multidisciplinary programs.

This program of study is offered by the Department of Geography and Geoinformation Science in the College of Science.

Admission Requirements

This program is intended for graduates who hold a BS or BA degree in atmospheric science, climatology, meteorology, Earth science, geology, environmental science, remote sensing and Earth observing, hydrology, oceanography, geography, or a related field with a minimum GPA of 3.00. Applicants should have knowledge of calculus and a working proficiency with a computer programming language.

Knowledge of mathematics through ordinary differential equations is preferred. Interested applicants should contact the academic coordinator or the GGS chair for more specific advice. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, a current résumé, and an expanded goals statement to the COS Fairfax Campus Graduate Admissions Processing Center.

Applicants should also include three letters of recommendation and an official report of scores obtained on the GRE-GEN. The GRE-SUB is recommended if it is given in the student’s undergraduate major. The GRE requirement for admission to the doctoral program may be waived if the student holds a master’s degree from an accredited U.S. institution. TOEFL scores are required of all international applicants. GRE-GEN scores are required of students wishing to be considered for a GMU Presidential Fellowship.

Reduction of Credit

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

Degree Requirements
Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

The curriculum consists of 72 credits: 48 credits of course work and 24 credits of dissertation research. The 48-credit requirement may be reduced by up to 30 credits for a qualified student holding a previous master’s degree. Up to 24 credits of previous, relevant graduate course work may be transferred into the program as long as those credits have not been applied toward a previous degree.

All students are required to take 18 credits of courses selected from a set of three core areas: computational-quantitative, geosciences-geography, and geoinformation. Students also take 6 credits of courses in one of the four areas of emphasis listed below:

- Geosciences (GSC)
- Geography (GEOG)
- Remote Sensing and Earth Observation (RS)
- Geographic Information Systems (GIS)

Students also have the option of taking courses from two or more emphasis areas, subject to the program director’s approval. Additional requirements include a single credit of colloquium taken three times, and electives relevant to the student’s focus.

**Doctoral Course Work (48 credits)**

**Core Courses (18 credits)**

All students are required to take 18 credits of courses selected from a set of three core areas.

**Computational-Quantitative Core**

Choose two courses (6 credits) from the following:

- CSI 600 - Quantitative Foundations for Computational Sciences Credits: 3
- CSI 700 - Numerical Methods Credits: 3
- CSI 703 - Scientific and Statistical Visualization Credits: 3
- CSI 710 - Scientific Databases Credits: 3
- GGS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
- GGS 791 - Advanced Spatial Statistics Credits: 3
- GGS 560 - Quantitative Methods Credits: 3

**Geosciences-Geography Core**

Choose two courses (6 credits) selected from the following:

- GGS 704 - Spatial Analysis and Modeling of Population Credits: 3
- GGS 721 - Biogeography Credits: 3
- GGS 657 OR GEOL 601 - The Lithosphere Credits: 3
- CSI 655 - Atmospheric Physics I Credits: 3 OR GGS 670 - Introduction to Atmosphere and Weather Credits: 3
- GGS 656 OR EVPP 652 - The Hydrosphere Credits: 3 OR GGS 725 - Advanced Hydrosphere Credits: 3
Geoinformation Sciences Core

Choose one course from the GIS group:

- GGS 553 - Geographic Information System Credits: 3
- GGS 563 - Advanced Geographic Information Systems Credits: 3
- GGS 653 - Geographic Information Analysis Credits: 3
- GGS 671 - Algorithms and Modeling in GIS Credits: 3

and one course from the Remote Sensing group:

- GGS 579 - Remote Sensing Credits: 3
- GGS 680 - Earth Image Processing Credits: 3
- GGS 756 - Physical Principles of Remote Sensing Credits: 3

Emphasis Courses (6 credits):

Two courses selected from those listed below for the desired area of emphasis. Students choosing not to select a specific area will be assisted by their faculty advisor in developing a curriculum plan by combining courses from two or more emphases shown below. The curriculum plan must be approved by the program director.

Geosciences:

- GGS 656 - The Hydrosphere Credits: 3
- GGS 721 - Biogeography Credits: 3
- GGS 725 - Advanced Hydrosphere Credits: 3
- CSI 655 - Atmospheric Physics I Credits: 3
- EVPP 550 - Waterscape Ecology and Management Credits: 3
- GEOL 601 - The Lithosphere Credits: 3

Geography:

- GGS 531 - Land-Use Modeling Techniques and Applications Credits: 3
- GGS 540 - Medical Geography Credits: 3
- GGS 575 - Reconstructing Past Environments: Seminar in Geoarchaeology Credits: 3
- GGS 560 - Quantitative Methods Credits: 3
- GGS 721 - Biogeography Credits: 3
- PUBP 810 - Regional Development and Transportation Policy Credits: 4
- PUBP 811 - Applied Methods in Regional Development and Transportation Policy Credits: 4
- EVPP 503 - Field Mapping Techniques Credits: 3
- EVPP 741 - Advanced Topics in Environmental Science and Public Policy Credits: 0-4
Remote Sensing and Earth Observation:

- GGS 579 - Remote Sensing Credits: 3
- GGS 658 - Terrain Mapping Credits: 3
- GGS 740 - Hyperspectral Imaging Systems Credits: 3
- GGS 754 - Earth Science Data and Advanced Data Analysis Credits: 3
- GGS 756 - Physical Principles of Remote Sensing Credits: 3
- GGS 680 - Earth Image Processing Credits: 3

Geographic Information Systems:

- GGS 553 - Geographic Information System Credits: 3
- GGS 563 - Advanced Geographic Information Systems Credits: 3
- GGS 590 - Selected Topics in Geography Credits: 1-3
- GGS 653 - Geographic Information Analysis Credits: 3
- GGS 661 - Map Projections and Coordinate Systems Credits: 3
- GGS 664 - Spatial Data Structures Credits: 3
- GGS 671 - Algorithms and Modeling in GIS Credits: 3
- GGS 772 - Distributed Geographic Information Systems Credits: 3
- GGS 773 - Interoperability of Geographic Information Systems Credits: 3

Electives (21 credits):

- 21 credits of approved electives

Colloquium (3 credits):

3 credits total, GGS 900 taken 3 times:

- GGS 900 - Colloquium Earth Systems Sciences Credits: 1

Dissertation Research (24 credits):

24 credits, with at least 12 credits in GGS 999:

- GGS 998 - Dissertation Proposal Credits: 1-12
- GGS 999 - Dissertation Credits: 1-12

Dissertation Committee
All students will be assigned a temporary academic advisor when they first enroll in the program. No later than the end of the second year, each student should identify a dissertation advisor and form a doctoral committee.

### Candidacy Examination

After completing all required courses, each student must take a candidacy exam administered by the dissertation committee. The exam will have written and oral components. Its purpose is to determine whether the student has acquired adequate general knowledge in the selected subject area, as well as much more detailed knowledge of the specific research topic planned for the dissertation.

### Dissertation Proposal and Advancement to Candidacy

After students have completed all required courses and passed the candidacy exam, they should prepare an acceptable dissertation proposal. After the dissertation proposal is approved, the student is formally advanced to doctoral candidacy.

### Doctoral Dissertation

The degree will be awarded on completion of the required course work and approval of a PhD thesis that makes an original and significant contribution to the field.

### Total: 72 credits

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### Mathematical Sciences

Phone: 703-993-1460  
Web: math.gmu.edu

#### Faculty

**Professors:** Alligood, Anderson, Colonna, Kulesza (undergraduate coordinator), J. Lawrence, Levy, Morris (graduate coordinator), Polyak, Sachs, Saperstone (Acting Chair), Sauer (COS distinguished scholar), Shapiro (Associate Chair), Singman, Soltan, Walnut, Wanner

**Associate professors:** Agnarsson, Goldin, Griva, Kiley, Lamba, Lin, Sander, Seshaiyer, Zoltek

**Assistant professors:** Emelianenko

**Admin professional:** O’Brien

**Term assistant professors:** Fall, Fernandez, Matthews, Nelson

**Term instructors:** Crossin, Granfield, O’Beirne, Sausville

**Affiliates:** Nash

**Emeritus:** Cabell
The department offers undergraduate and graduate degree programs in mathematics for students with various interests and career goals. Students may pursue the standard program or pursue a program focused on either actuarial mathematics or applied mathematics. Students may complement other interests by taking a double major in mathematics and a related field, such as chemistry, economics, physics, computer science, or engineering.

Graduating seniors are required to have an exit interview.

**Course Work**

The Mathematical Sciences Department offers all course work designated MATH in the Courses chapter of this catalog.

**Writing-Intensive Requirement**

Mason policy requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in mathematics fulfill this requirement by successfully completing MATH 290.

**Math Tutoring Center**

The department manages the Math Tutoring Center, which offers free tutoring for first- and second-year math courses ([math.gmu.edu/tutorcenter.htm](http://math.gmu.edu/tutorcenter.htm)). Tutoring is given by advanced mathematics students and available on a drop-in basis with daytime and evening hours throughout the term.

**Math Learning Center**

The Math Learning Center ([math.gmu.edu/mathlearningcenter.htm](http://math.gmu.edu/mathlearningcenter.htm)) for a small fee offers self-paced and classroom noncredit tutorial programs for students who do not place into the math course they need. Special tutors and tutorial software are available to those enrolled in the program. Successful completion of the relevant program enables students to enroll in Math 105, 108, 110, 111, 112, or 125.

**Honors Program in Mathematics**

Mathematics majors who have maintained a GPA of at least 3.50 in Mathematics courses and a GPA of 3.50 in all courses taken at George Mason University may apply to the departmental honors program upon completion of two MATH courses at the 300+ level (excluding MATH 400), at least one of which has MATH 290 as a prerequisite. Admission to the program will be monitored by the undergraduate committee. To graduate with honors in mathematics, a student is required to maintain a minimum GPA of 3.50 in mathematics courses and successfully complete MATH 405 and 406 with an average GPA of at least 3.50 in these two courses.

**Teacher Licensure**

Students who wish to become high school teachers should consider a concentration in education, available in either the BA or BS degree programs. Students with an interest in education may also consult the College of Education and Human Development chapter and attend an information session. For more information, call 703-993-2892, e-mail gseadmit@gmu.edu, or go to gse.gmu.edu.

**Certificate in College Teaching**
A student enrolled in the MS or PhD program in mathematics who is primarily interested in pursuing a career in undergraduate education at the college level is encouraged to consider enrolling in the Higher Education Program’s College Teaching Graduate Certificate, offered through the College of Humanities and Social Sciences (LA-CERG-CTCH). Credit can be earned for CTCH 685 (practicum) by working one semester as a graduate teaching assistant in the Mathematics Department.

**Mathematics, Bachelor’s/Accelerated Master’s Degree**

Qualified undergraduates may be admitted to an accelerated master’s program and obtain both a BS and an MS in Mathematics within an accelerated time frame. Students admitted to this program may take graduate courses after completing 90 undergraduate credits, and up to 6 credits of graduate work may be used in partial satisfaction of the requirements for the undergraduate degree. If students earn at least a 3.00 in these classes, they are granted advanced standing in the master’s program and must then complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met, including a minimum of 18 credits taken for the master’s after the bachelor’s degree is complete.

**Undergraduate Degree**

**Mathematics, BA**

**Banner Code: SC-BA-MATH**

Students may select an optional concentration in mathematics education; students who do not select this concentration study traditional mathematics.

Students must fulfill all requirements for bachelor's degrees. In addition to satisfying university-wide general education requirements and requirements for the BA degree in COS, students must satisfy the requirements listed below.

This program of study is offered by the Department of Mathematical Sciences in the College of Science.

**Degree Requirements**

**Core Courses (26 credits):**

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3 or MATH 215 - Analytic Geometry and Calculus III (Honors) Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3 or MATH 216 - Theory of Differential Equations Credits: 3
- MATH 290 - Introduction to Advanced Mathematics Credits: 3
• MATH 322 - Advanced Linear Algebra Credits: 3

Electives for Traditional Mathematics (12 credits):

• 12 additional credits of electives in MATH numbered above 300 (excluding MATH 400)

Concentrations

Students may select an optional concentration in education.

▲ Concentration in Mathematics Education (MTHE)

Students selecting the mathematics education concentration take the following 33 credits of coursework in place of the 12 credits of MATH electives listed above.

• EDCI 372 - Teaching Mathematics in the Secondary School Credits: 3
• EDCI 483 - Advanced Methods of Teaching Science in Secondary School Credits: 3
• EDCI 490 - Student Teaching in Education Credits: 6
• EDRD 419 - Literacy in the Content Areas Credits: 3
• EDUC 372 - Human Development, Learning, and Teaching Credits: 3
• EDUC 422 - Foundations of Secondary Education Credits: 3
• MATH 302 - Foundations of Geometry Credits: 3
• MATH 315 - Advanced Calculus I Credits: 3
• MATH 321 - Abstract Algebra Credits: 3
• MATH 351 - Probability Credits: 3

Note:

The above courses satisfy the university-wide requirement in quantitative reasoning. A maximum of 6 credits of grades below 2.00 in course work designated MATH may be applied toward the major.

Mathematics, BS

Banner Code: SC-BS-MATH

Students may select an optional concentration in actuarial mathematics (ACTM), applied mathematics (AMT), mathematics education (MTHE) or mathematical statistics. Students who do not select a concentration study traditional mathematics.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students majoring in mathematics must satisfy the requirements listed below. These courses satisfy the university-wide requirement in quantitative reasoning and natural sciences. A maximum of 6 credits of grades below 2.00 in course work designated MATH may be applied toward the major.

This program of study is offered by the Department of Mathematical Sciences in the College of Science.

Degree Requirements
Mathematics Core (23 credits):

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 203 - Linear Algebra Credits: 3

- MATH 213 - Analytic Geometry and Calculus III Credits: 3
  or
- MATH 215 - Analytic Geometry and Calculus III (Honors) Credits: 3

- MATH 214 - Elementary Differential Equations Credits: 3
  or
- MATH 216 - Theory of Differential Equations Credits: 3

- MATH 290 - Introduction to Advanced Mathematics Credits: 3
- MATH 322 - Advanced Linear Algebra Credits: 3

Science (8 credits):

All students in the major choose a one-year sequence of a laboratory science from the following:

Chemistry sequence:
- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4

Geology sequence:
- GEOL 101 - Introductory Geology I Credits: 4
- GEOL 102 - Introductory Geology II Credits: 4

Physics sequence:
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

Computational Skills (4 or 7 credits):

- All students in the major take CS 112 - Introduction to Computer Programming Credits: 4
- In addition, students in the actuarial concentration take STAT 362 - Introduction to Computer Statistical Packages Credits: 3

Additional Coursework for Traditional Mathematics (24 credits):

- MATH 125 - Discrete Mathematics I Credits: 3
• MATH 315 - Advanced Calculus I Credits: 3
• MATH 316 - Advanced Calculus II Credits: 3
• MATH 321 - Abstract Algebra Credits: 3 or MATH 431 - Topology Credits: 3
• 12 additional credits of MATH course numbered above MATH 300 (excluding MATH 400)

Departmental Non-mathematical Requirements

• Students selecting traditional mathematics or those undertaking either the applied mathematics concentration, mathematics education, or the mathematical statistics concentration must select a second year of science from one of the following three options: a second sequence from the choices under "Science (8 credits)" above; 6 credits from more advanced courses in chemistry, geology, or physics (but only courses acceptable for credit toward a natural science major); or the 4-credit option PHYS 262, PHYS 263.
• Students with an actuarial concentration must have 3 credits of ACCT 203 and 6 credits of economics, including ECON 103 (3 credits) and either ECON 306 or 310, or FNAN 321. (The Economics Department has agreed to waive ECON 104 as a prerequisite for ECON 306 for mathematics majors.)
• The department recommends proficiency in French, German, or Russian.

Concentrations

Students may select an optional concentration in applied mathematics (AMT), actuarial mathematics (ACTM), or mathematics education (MTHE) or mathematical statistics (MTHS). Students selecting a concentration take the courses listed below instead of the 24 credits of additional mathematics taken by students without a concentration. The concentration requirements comprise 24 credits for the AMT and ACTM concentrations, 27 credits for the MTHS concentration, and 39 credits for the MTHE concentration.

▲ Concentration in Applied Mathematics (AMT)

• MATH 125 - Discrete Mathematics I Credits: 3
• MATH 315 - Advanced Calculus I Credits: 3
• MATH 351 - Probability Credits: 3
• MATH 413 - Modern Applied Mathematics I Credits: 3
• MATH 414 - Modern Applied Mathematics II Credits: 3
• MATH 446 - Numerical Analysis I Credits: 3
• 6 credits of course work above MATH 300 (excluding MATH 400)

Total: 24 credits

▲ Concentration in Actuarial Mathematics (ACTM)

• MATH 351 - Probability Credits: 3
- MATH 352 - Statistics Credits: 3
- MATH 441 - Deterministic Operations Research Credits: 3
- MATH 442 - Stochastic Operations Research Credits: 3
  or
- MATH 446 - Numerical Analysis I Credits: 3
- MATH 551 - Regression and Time Series Credits: 3
- MATH 554 - Financial Mathematics Credits: 3
- MATH 555 - Actuarial Modeling I Credits: 3
- MATH 556 - Actuarial Modeling II Credits: 3

Total: 24 credits

▲ Concentration in Mathematics Education (MTHE)

Note: EDCI 490 and EDUC 372 also satisfy the general education requirements for synthesis and social science, respectively.

- EDCI 372 - Teaching Mathematics in the Secondary School Credits: 3
- EDCI 483 - Advanced Methods of Teaching Science in Secondary School Credits: 3
- EDCI 490 - Student Teaching in Education Credits: 6
- EDRD 419 - Literacy in the Content Areas Credits: 3
- EDUC 372 - Human Development, Learning, and Teaching Credits: 3
- EDUC 422 - Foundations of Secondary Education Credits: 3
- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 302 - Foundations of Geometry Credits: 3
- MATH 315 - Advanced Calculus I Credits: 3
- MATH 321 - Abstract Algebra Credits: 3
- MATH 351 - Probability Credits: 3
- one 3-credit MATH course numbered above MATH 300 (excluding MATH 400)

Total: 39 credits

Concentration in Mathematical Statistics (MTHS)

- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 315 - Advanced Calculus I Credits: 3
- MATH 351 - Probability Credits: 3
- MATH 352 - Statistics Credits: 3
• MATH 453 - Advanced Mathematical Statistics Credits: 3
• MATH 551 - Regression and Time Series Credits: 3
• STAT 362 - Introduction to Computer Statistical Packages Credits: 3
and two from the following four courses:
• STAT 455 - Experimental Design Credits: 3
• STAT 457 - Applied Nonparametric Statistics Credits: 3
• STAT 463 - Introduction to Exploratory Data Analysis Credits: 3
• STAT 474 - Introduction to Survey Sampling Credits: 3

Total: 27 credits

General Comments

For math majors:

MATH 104, 105, 106, 108, 110, 111, 112, 271, and 272 cannot be used as substitutes for any requirements of the major in mathematics.

For non-math majors:

• MATH 108, 110, and 111 are designed for students in the social and behavioral sciences.
• Liberal arts majors are advised to take MATH 106, 110, or 111.
• Students in the natural sciences who plan to do graduate work are advised to add courses from MATH 313, 314, 351, 352, 382, 441, 442, 446, and 447.

For both math majors and non-math majors:

• MATH 104, 105, 108, 110, 111, 112, 113, 125 have a qualifying score on the Math Placement Test as a prerequisite. The Math Placement Test is given frequently; for the schedule, inquire at the department office or check the Math Department web site.
• Students who do not achieve the necessary test score needed to take a math course may go to the Math Learning Center (see below), or they may study and retake the test on their own. A student who does not complete the relevant program in the Learning Center or does not achieve the necessary score on the placement test, will not be able to enroll in the class. Depending on their test scores, students who do not place into MATH 113 will be advised to take MATH 104 or MATH 105 or visit the Math Learning Center to prepare for MATH 105.
• MATH 104 and MATH 105 do not fulfill the university quantitative reasoning requirement.
• Students may not receive credit for both MATH 214 and 216; both MATH 213 and 215; both MATH 351 and STAT 344; and both MATH 352 and STAT 354.
• After receiving a grade of C or better in one of the courses listed below on the left, students may not receive credit for the corresponding course on the right:

  MATH 113
  MATH 351 or STAT 344

  MATH 105 or 108
  MATH 110
Undergraduate Minor

Mathematics for School of Management Students Minor

Banner Code: MSOM

This program of study is offered by the Department of Mathematical Sciences in the College of Science.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

To receive this minor, students must complete 20 credits, 8 of which must be unique to the minor, with a minimum GPA of 2.00, including:

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- MATH 351 - Probability Credits: 3

One course chosen from:

- MATH 352 - Statistics Credits: 3
- MATH 441 - Deterministic Operations Research Credits: 3
- MATH 554 - Financial Mathematics Credits: 3

Total: 20 credits

Mathematics Minor

Banner Code: MATH

To receive a minor in mathematics, students must complete 21 credits, 8 credits of which are unique to the minor and not applied toward the major. These courses must have a minimum GPA of 2.00. For policies governing all minors, see the Academic Policies section of this catalog.

This program of study is offered by the Department of Mathematical Sciences in the College of Science.
Course Work

Five required courses (15 credits):

- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
  or
- MATH 215 - Analytic Geometry and Calculus III (Honors) Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3
  or
- MATH 216 - Theory of Differential Equations Credits: 3
- MATH 290 - Introduction to Advanced Mathematics Credits: 3

One math elective course (3 credits) chosen from:

- MATH 315 - Advanced Calculus I Credits: 3
- MATH 321 - Abstract Algebra Credits: 3
- MATH 322 - Advanced Linear Algebra Credits: 3

One general elective course (3 credits) chosen from:

- one 3-credit math course at the 300 or 400 level (excluding MATH 400), or
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Note:

Students must earn a 2.00 or better in MATH 290 and the courses chosen to fulfill the second requirement.

Total: 21 credits

Bachelor's/Accelerated Master's Program
Mathematics, BS/Mathematics, Accelerated MS

This five-year degree program allows academically strong students to obtain a BS and MS by successfully completing 144 credits within five academic years and one summer. Well-prepared students are admitted to this program on completion of 90 credits, take selected graduate courses during their senior year, and are able to use up to 6 graduate credits to partially satisfy requirements for the undergraduate degree. On completion and conferral of that degree and with satisfactory graduate-level performance (3.00) in graduate courses, students are given advanced standing in the master’s program and complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met.

This program of study is offered by the Department of Mathematical Sciences in the College of Science.

Dual Degree

Mathematics and Statistical Science Dual-Degree MS (COS)

Banner Codes: SC-MS-MATH, VS-MS-STAT

Schools: College of Science and The Volgenau School of Engineering

Departments: Mathematical Sciences and Statistics

This program allows students to earn an MS degree in mathematics and an MS degree in statistical science by completing 48 credits of course work in both areas instead of the 60 that would be required if the degrees were sought independently.

Admission Requirements

Applicants must satisfy admission requirements for both the Mathematics, MS and the Statistical Science, MS programs. A joint faculty committee from the Mathematical Sciences and Statistics Departments make final admission decisions into the dual-degree program.

MS-MATH/STAT Dual-Degree Requirements

The dual-degree program requires a total of 48 credits as specified below:

- MATH 621 - Algebra I Credits: 3
- MATH 675 - Linear Analysis Credits: 3
- MATH 677 - Ordinary Differential Equations Credits: 3 or MATH 678 - Partial Differential Equations Credits: 3
- MATH 685 - Numerical Methods Credits: 3
- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 652 - Statistical Inference Credits: 3
- STAT 656 - Regression Analysis Credits: 3

Elective Credits
• 12 elective credits in MATH courses numbered 610 or higher, excluding MATH 653, 654, 655 and 799. Courses must be approved in advance by the student’s mathematical sciences academic advisor and the mathematical sciences graduate coordinator.

• 12 elective credits in 500-, 600-, or 700-level STAT courses, excluding STAT 535 and 799. Courses must be approved in advance by the student’s statistics academic advisor and the statistics graduate coordinator.

Total: 48 credits

Notes:

• Students in either the BS/Accelerated MS in Mathematics Program or the BS/Accelerated MS in Statistics Program cannot get a reduction of 6 credits toward this dual degree. Students who want to proceed to a PhD degree will only be able to waive the number of credits specified in the associated PhD degree requirements, even though they will have 48 credits at the MS level.

• If a student decides not to complete the required 48 credits, a single MS degree will not be granted unless the student fulfills the requirements for either the MS in mathematics or the MS in statistical science.

• Once a student receives one of the MS degrees from either department, the student will no longer be eligible for the reduction in credit (i.e., will need to complete 30 credits) if the student later decides to earn the other MS degree.

Master's Degree

Mathematics, MS

Banner Code: SC-MS-MATH

The Department of Mathematical Sciences offers courses in pure and applied mathematics leading to the master of science degree in mathematics. The program offers a standard mathematics program and an emphasis in computational and applied mathematics. This program of study is offered by the Department of Mathematical Sciences in the College of Science.

Admission Requirements

In addition to fulfilling admission requirements for graduate study, applicants must submit three letters of recommendation. GRE scores are not required.

Students intending to pursue the MS degree must have taken an upper-division course in advanced calculus (equivalent to MATH 315) and an upper-division course in linear algebra (equivalent to MATH 322). Students intending to go into the computational and applied mathematics emphasis must have some computer knowledge.

Assistantships

A limited number of merit-based teaching assistant ships are available for students taking at least 6 graduate credits each semester. Other sources of support, such as research assistant ships, are available as funding permits. Graduate students also have the opportunity to work in the Math Tutoring Center and Math Learning Center.

Degree Requirements
Candidates for the MS in mathematics must satisfy all requirements for master's degrees as expressed in the Academic Policies section of this catalog.

Standard Program

Students must complete 30 credits distributed as follows:

- MATH 621 - Algebra I Credits: 3
- MATH 675 - Linear Analysis Credits: 3
- Six approved graduate courses (18 credits), at least four of which are MATH. All six courses must be approved by the student’s advisor. Courses not listed as MATH courses must be approved by the Graduate Committee. Different rules apply if the student wishes to count graduate actuarial courses toward his or her degree (see below).
- Research and creative component (6 credits; see below)

Total: 30 credits

Emphasis in Computational and Applied Mathematics

The emphasis in computational and applied mathematics provides students with the analytical skills and background in computational techniques most relevant to the needs of business, industry, and government. The large number of high-technology firms, telecommunications firms, and government laboratories in the Washington, D.C., metropolitan area gives students an opportunity to gain practical experience and secure employment after graduation.

Students must complete 30 credits distributed as follows:

- MATH 621 - Algebra I Credits: 3
- MATH 675 - Linear Analysis Credits: 3
- MATH 677 - Ordinary Differential Equations Credits: 3 or
  - MATH 678 - Partial Differential Equations Credits: 3
- MATH 685 - Numerical Methods Credits: 3
- Four approved graduate courses (12 credits), at least two of which are MATH courses. All four courses must be approved by the student’s advisor. Courses not listed as MATH courses must be approved by the Graduate Committee.
- Research/creative component (6 credits; see below)

Total: 30 credits

Research and Creative Component

A student may fulfill the research and creative component of the MS degree in any one of the following three ways:

Thesis Option
In preparation for this option, the student must form a committee comprising a chair and two other faculty members. The chair and at least one other member must be from the department; one member may be from a related field.

The student completes a thesis under the direction of the committee chair. The thesis work is typically completed while students are registered for 6 credits of MATH 799. A thesis proposal and thesis are submitted in accordance with university rules. The student must give an oral defense of the thesis to the committee and the Mason community at large. Students are expected to respond to questions on the thesis and related material. The committee determines whether the defense is satisfactory.

- MATH 799 - MS Thesis Credits: 1-6

**Paper Presentation Option**

In preparation for this option, the student must form a committee comprising a chair and two other faculty members. The chair and at least one other member must be from the department; one member may be from a related field. The student gives an oral presentation of a paper (or series of papers or book chapter) chosen in consultation with the chair of the committee and approved by the full committee. The chosen material must be distinct from work done in fulfillment of course requirements. Students choosing this option take 6 additional credits of electives. The oral presentation is given to the committee and the Mason community at large. Students are expected to respond to questions on the paper and related material. The committee determines whether the defense is satisfactory.

**Preliminary Exam for the PhD**

The research and creative component of the MS degree can also be fulfilled by passing the preliminary written examination for the Mathematics PhD degree.

**Master's Level Certificate**

**Actuarial Sciences Graduate Certificate**

**Banner Code: SC-CERG-ACTS**

The certificate in actuarial sciences is designed to serve students and professionals in the Washington, D.C., area who are interested in pursuing careers as actuaries. The course content provides students with specific training related to the Society of Actuaries (SOA) Exam FM (formerly Course 2), SOA Exam MLC (formerly Course 3), SOA Exam C (formerly Course 4), VEE for applied statistics (formerly part of Course 4), and Exam EA-1 and EA-2A (for those pursuing EA designation from the U.S. Treasury). The courses also provide a solid foundation for the corresponding Casualty Actuary Society (CAS) exams. Preparation for the first exam is equivalent to meeting the prerequisites for the certificate courses in the area of probability and statistics. Students enrolling in the actuarial sciences certificate program must complete the 6 course (18 credit) curriculum requirement described below.

The graduate certificate in actuarial sciences may only be pursued on a part-time basis.

This program of study is offered by the Department of Mathematical Sciences in the College of Science.

**Admission Requirements**

In addition to fulfilling admission requirements for graduate study, applicants must submit three letters of recommendation. GRE scores are not required.
Students intending to pursue a certificate in the actuarial sciences must have three semesters of calculus, a course in linear algebra (equivalent to MATH 203), a calculus-based course in probability (equivalent to MATH 351), and statistics (equivalent to MATH 352). Completion of the SOA Exam P is also sufficient preparation for the certificate program.

Certificate Requirements

Core Courses (12 credits):

- MATH 551 - Regression and Time Series Credits: 3
- MATH 554 - Financial Mathematics Credits: 3
- MATH 555 - Actuarial Modeling I Credits: 3
- MATH 556 - Actuarial Modeling II Credits: 3

Electives (6 credits from the following):

- MATH 557 - Financial Derivatives Credits: 3
- MATH 653 - Construction and Evaluation of Actuarial Models I Credits: 3
- MATH 654 - Construction and Evaluation of Actuarial Models II Credits: 3
- MATH 655 - Pension Valuation Credits: 3 (recommended only for students who wish to pursue a career as a pension actuary)
- any other elective course approved by the Graduate Committee and chosen in consultation with advisor.

Total: 18 credits

Notes:

The graduate certificate course work provides preparation for SOA, CAS, and EA exams as follows. MATH 551 is the SOA VEE for Applied Statistics and is preparation for part of the CAS Exam 3. MATH 554 covers most of the SOA Exam FM material as well as CAS Exam 2 and much of the EA-1 exam. MATH 555 and 556 cover all of the Exam MLC material and most of the CAS Exam 3L as well as the remainder of the EA-1 exam. MATH 557 covers all of the SOA EXAM MFE material. MATH 653 and 654 covers all of the SOA Exam C material as well as CAS Exam 4. MATH 655 covers all of the EA-2A Exam material.

Counting Actuarial Courses for Other Mathematics Degrees

A student enrolled in the certificate program in actuarial sciences and another graduate degree program in mathematics can count actuarial mathematics courses toward the master's or doctoral degree according to the following rules:

- None of the actuarial mathematics courses MATH 551, 554, 555, 556, 557, 653, 654, and 655 can count toward the PhD degree in mathematics.
• None of the actuarial mathematics courses MATH 551, 554, and 655 can count toward the MS degree in mathematics.
• Up to four of the actuarial mathematics courses MATH 555, 556, 653, and 654 can count toward the MS degree in mathematics provided that all other courses counted toward that degree are MATH courses. An exception can be made if the student wishes to count only one actuarial mathematics course from the list toward the MS degree. In this case, at most one other non-MATH course can be counted toward the degree with approval of the graduate coordinator.

Counting Actuarial Courses toward the Statistical Sciences MS Degree

A student enrolled in the certificate program in actuarial sciences and in the MS program in statistical science can count MATH 555 and 556 as approved non-STAT elective courses and can count MATH 653 and 654 as STAT electives when designing a curriculum for this degree. The full curriculum should be designed in consultation with the student’s Statistics Department advisor.

Doctoral Degree

Mathematics, PhD

Banner Code: SC-PHD-MATH

The Department of Mathematical Sciences offers a PhD in mathematics. The program begins with graduate course work and advanced seminars and culminates in a thesis consisting of original research in mathematics. The PhD program in mathematics is designed to train students as research mathematicians for careers in academia, government, and private industry.

This program of study is offered by the Department of Mathematical Sciences in the College of Science.

Admission Requirements

It is expected that all applicants have a recent bachelor’s degree in mathematics or an equivalent amount of undergraduate mathematics preparation, with a GPA of at least 3.00 in their last 60 credits of study. Students without this background who have had an upper-division course in linear algebra (equivalent to MATH 322), an upper-division course in advanced calculus (equivalent to MATH 315), and familiarity with basic group theory (such as presented in MATH 321) are encouraged to apply to the MS program in mathematics. Such students may subsequently apply to the PhD program when all background issues have been addressed. It is recommended that all applicants have some familiarity with mathematical software.

To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, three letters of recommendation, and a goals statement to the COS Fairfax Campus Graduate Admissions Processing Center. TOEFL scores are required for all international applicants. GRE scores are recommended but not required.

Reduction of Credit

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

Fellowships and Assistantships
The Department of Mathematical Sciences offers a limited number of merit-based teaching assistantships. Other sources of support, such as research fellowships and assistantships, are available as funding permits. Graduate students also have the opportunity to work in the Math Tutoring Center and the Math Learning Center.

**Degree Requirements**

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

The program requires 72 credits beyond the baccalaureate degree, with a minimum of 48 credits in course work and 12–24 credits of dissertation research. For those holding master’s degrees, the 72 required credits may be reduced by up to 30 credits, depending on graduate courses completed.

Graduate mathematics courses taken elsewhere may be counted toward the degree either as transfer credit or through reduction of credit. Classes at the 500 level and actuarial classes MATH 653, 654, and 655 cannot be used for credit toward a PhD in mathematics.

Students must complete the following curriculum requirements:

**Doctoral Course Work (48-60 credits)**

**Core Courses (12 credits):**

- MATH 675 - Linear Analysis Credits: 3
  plus any three of the following:
  - MATH 621 - Algebra I Credits: 3
  - MATH 631 - Topology I: Topology of Metric Spaces Credits: 3
  - MATH 677 - Ordinary Differential Equations Credits: 3
  - MATH 685 - Numerical Methods Credits: 3

**Preliminary Written Exam**

Students are required to take a preliminary written exam after completing the core courses, usually by the end of their second year. The exam is based on material presented in three of their four core courses (the student may choose which topic to exclude). These exams are offered two times a year. Students may take the exam as often as they like. A grade of "pass" on the preliminary written exam is sufficient to satisfy the creative component of the master's degree in mathematics.

**Dissertation Advisor and Examination Committee**

After passing the preliminary written exam, the student chooses a dissertation advisor and a three person examination committee. In consultation with the advisor and committee, the student chooses a major and a minor area of study (the major and minor areas are presumed to be in two different branches of mathematics).

**Seminar (6–9 credits):**
All PhD students are required to take a 1-credit seminar (MATH 795) each semester. A student entering without a master’s degree in mathematics should expect to take a total of 8 to 9 credits of MATH 795.

- MATH 795 - Graduate Seminar Credits: 1

Electives (27-42 credits):

27-42 credits of approved MATH electives. Courses not designated as MATH courses must be approved by the graduate committee.

Qualifying Examinations

Students are required to take a qualifying exam after passing the preliminary written exam. The qualifying exam will have oral and written components. In consultation with the advisor and committee, the student chooses a major and a minor area of study (the major and minor areas are presumed to be in two different branches of mathematics). The qualifying exam cover the equivalent of approximately four courses of material from the major area and three courses from the minor area.

Dissertation Proposal and Advancement to Candidacy

Approximately one semester after passing the qualifying exam, each doctoral student prepares a written dissertation proposal while taking MATH 998 (Doctoral Dissertation Proposal). The proposal must be approved by the thesis committee, which consists of the three qualifying exam committee members, plus a fourth member from outside the department. After successfully completing this requirement, the student advances to doctoral candidacy.

Dissertation Research (12–24 credits):

- MATH 998 - PhD Thesis Proposal Credits: 1-9
- MATH 999 - PhD Thesis Research Credits: 1-12

Doctoral Dissertation

After advancing to candidacy, the student will work on a doctoral dissertation while enrolled in MATH 999. The dissertation is a written piece of original mathematics that demonstrates a doctoral candidate’s mastery of the subject matter. A student is expected to produce new and original research worthy of publication in a peer-reviewed journal. After the thesis is completed, the committee will review the thesis and examine the student in a public oral thesis defense.

Total: 72 credits

Neuroscience Program

Phone: 703-993-4333
Web: gmu.edu/departments/neuroscience
Faculty

Director: Jafri

Professors: Ascoli, Blackwell, Butler, Jafri, Olds, Smith, McCabe, Parasuraman

Associate professors: Barreto, Cebral, Flinn, Fryxell, Greenwood, Houser, Kalbfleisch, Kello, Klimov, Peterson, Sander, So

Assistant professors: Cox, Dumas, Kabbani, Kozhevnikov, Krueger, Peixoto, Sikdar, Thompson

Neuroscience at George Mason University is an interdisciplinary field, grounded in biology, chemistry, and psychology. Research and education in neuroscience at Mason is conducted under the auspices of the Neuroscience Advisory Council (NAC). The BS degree in neuroscience is administered by the Psychology department in the College of Humanities and Social Sciences, and the PhD program in neuroscience is administered by the College of Science. The neuroscience faculty at Mason comprise a unique blend of traditional, experimental, and theoretical scientists. They include faculty in the Psychology; Molecular Neuroscience; Molecular and Microbiology; Physics and Astronomy; Bioinformatics and Computational Biology, and Electrical Engineering departments. Research in neuroscience focuses on the broad areas of behavior, anatomy, physiology, neuropharmacology, computational modeling, and informatics. Some of the key research initiatives currently underway at Mason include studies of:

- effects of drugs and alcohol on behavioral and neurological development
- identifying and characterizing protein interactions for the dopamine and nicotinic acetylcholine receptors in the brain
- biochemical dynamics in disorders of the basal ganglia
- computational methods for simulation of complex biological systems
- description and generation of neuronal morphology
- adaptive control for stabilization of epilepsy
- role of metals in memory and Alzheimer's disease
- biochemical/metabolic simulations at the organism level
- cellular and sub-cellular models of associative learning

Course Work

The program offers all course work designated NEUR in the Courses chapter of this catalog.

Doctoral Degree

Neuroscience, PhD

Banner Code: SC-PHD-NEUR

The interdisciplinary doctoral program in neuroscience is offered jointly by the College of Science, the College of Humanities and Social Science, and the Krasnow Institute for Advanced Study.

The program focuses on the complexity of the brain and addresses the challenge of developing an integrative understanding of cognition and higher brain function. In response to this challenge, the rapidly developing field of neuroscience has produced an exponential increase in the amount of data available to investigators as they develop new theories of brain function and new hypotheses to test. The main objective of the program is to prepare students to participate at the cutting edge of this exciting field in academia, industry, and government. The program provides students with a rich interdisciplinary intellectual environment that fosters the development of the skills they will need to successfully pursue research careers.
Current faculty research focuses on the broad areas of behavior, anatomy, physiology, neuropharmacology, molecular biology, computational modeling, and informatics. External research collaborations exist with federal agencies, private and not-for-profit corporations, and other universities. The scope of research ranges from the subcellular and molecular level (in the context of such phenomena as drug addiction and the biological basis of schizophrenia) to the systems and behavioral level.

Current research projects include the effects of drugs and alcohol on behavioral and neurological development, plasticity mechanisms supporting development, network formation and information processing, cellular and subcellular models of associative learning, biochemical dynamics in disorders of the basal ganglia, computational methods for simulation of complex biological systems, role of metals in memory and Alzheimer’s disease, and dynamical behavior of neurons and networks of neurons, and identifying and characterizing protein interactions for the dopamine and nicotinic acetylcholine receptors in the brain.

**Admission Requirements**

Applicants should have a bachelor’s degree in a relevant field and undergraduate courses in organic chemistry, cell biology, and integral calculus. Admission requires a minimum GPA of 3.25 in undergraduate work and acceptable GRE scores. In addition, the applicant's goals statement should relate to the research interests of at least one faculty member in the program and include the names of two faculty members who may be suitable as advisors or supervisory committee members. To apply, prospective students should forward to the COS Fairfax Campus Graduate Admissions Processing Center a completed Mason graduate application including the goals statement, and two copies of official transcripts from each college and graduate institution attended. Applicants should also include three letters of recommendation and an official report of scores obtained on the GRE-GEN. The GRE-SUB is recommended if it is given in the student's undergraduate major. TOEFL scores are required of all international applicants.

**Reduction of Credit**

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

**Degree Requirements**

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

The curriculum for the Neuroscience PhD consists of 72 credits: 48 credits of course work and 24 credits of dissertation research. The 48-credit requirement may be reduced by up to 30 credits for a qualified student holding a previous relevant master’s degree. Alternatively, up to 24 credits of previous, relevant graduate course work may be transferred into the program provided those credits have not been applied toward a previous degree. Additional requirements for graduation include a dissertation and at least one publication (in print or in press) in a refereed journal.

**Doctoral Course Work (48 credits)**

**Core Science (9 credits):**

- NEUR 604 - Ethics in Scientific Research Credits: 1-3
- NEUR 702 - Research Methods Credits: 3
and one course chosen from the following:

- STAT 535 - Analysis of Experimental Data Using SPSS Credits: 3
- PSYC 611 - Advanced Statistics Credits: 4
- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- BINF 702 - Research Methods Credits: 3
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3

Core Neuroscience (11 credits):

- NEUR 601 - Developmental Neuroscience Credits: 2
- NEUR 602 - Cellular Neuroscience Credits: 3
- NEUR 603 - Mammalian Neurobiology Credits: 3
- NEUR 701 - Neurophysiology Laboratory Credits: 3

Rotations and Readings (9 credits):

taken three times:

- NEUR 703 - Laboratory Rotation and Readings Credits: 3

Electives (18 credits):

- 18 credits of electives

Seminar (1 credit):

- NEUR 709 - Neuroscience Seminars Credits: 1

Doctoral Committee and Proposal

When course work is nearing completion, the student should form a doctoral committee and start preparing their dissertation proposal. Students in consultation with their advisor identify which faculty are appropriate to be a part of their committee. The dissertation committee administers the qualifying exam and evaluates the dissertation proposal as well as the dissertation itself. At least one of the committee members must be outside of the dissertation advisor's department.

Candidacy Examination and Advancement to Candidacy

The doctoral candidacy examination includes written and oral components. After passing the candidacy exam and receiving committee approval for the dissertation proposal, the student is advanced to doctoral candidacy.
Dissertation Research (24 credits):

Note: No more than 24 combined credits from NEUR 998 and NEUR 999 may be applied toward satisfying doctoral degree requirements, with no more than 12 credits of NEUR 998.

- NEUR 998 - Dissertation Proposal Credits: 1-6
- NEUR 999 - Doctoral Dissertation Credits: 1-12

Total: 72 credits

■ School of Physics, Astronomy, and Computational Sciences

Phone: 703-993-1280
Web: spacs.gmu.edu

Faculty

Professors: Becker (Associate Director), Blaisten-Baroajas, Borne, Carr*, Cebral, Dworzecka, Ehrlich, Ellsworth, Gentle, Lieb, Lohner, Mishin, Papaconstantopoulos, Rubin, Satija, Satyapal, Summers (Director), T. Sauer*, Trefil, Wegman, C. Yang


Assistant professors: Camelli, Cressman, Nikolic, Rosenberg, Sheng, Tian, Zhao

Term associate professor: Oerter

Term assistant professors: Geller, Jazaeri, Wyczalkowski

Term instructors: Ericson, Ewell

Emeriti: Ceperley, Evans, Mielczarek

Research faculty: Aubry, Bilitza, Boyer, Dere, Duxbury, Economou, Gliozzi, Hoang, Kim, Meier, Mut, Odstrcil, Poland, Richards, Sforza, Sha, Shabaev, Titarchuk

*Faculty holding primary appointments in other academic units.

The School of Physics, Astronomy, and Computational Sciences offers undergraduate and graduate degree programs for students with interests and career goals involving physics, computational sciences, data science, and astronomy. In addition, the School provides traditional and interdisciplinary research opportunities at the graduate and undergraduate levels, and benefits from a very high level of external grant funding. Additional information about current faculty research activities is available on the School's website, spacs.gmu.edu.

Course Work
The School of Physics, Astronomy, and Computational Sciences offers all course work designated ASTR, CDS, CSI, and PHYS in the Courses chapter of this catalog.

Undergraduate Programs

The School offers bachelor's degrees in Physics, in Computational and Data Sciences, and in Astronomy. Minors are available in Astronomy, in Computational and Data Sciences, and in Physics. An interdisciplinary minor is offered in Renewable Energy.

Undergraduate Research Opportunities

The School offers many opportunities for undergraduate students to get involved with research. Students should consult with faculty working on research topics of interest to them, based on their exploration of the School's web site.

Bachelor’s/Accelerated Master’s Degree

Qualified undergraduates may be admitted to an accelerated master’s program and obtain both a BS and an MS in Physics within an accelerated time frame. Students admitted to this program may take graduate courses after completing 90 undergraduate credits, and up to 6 credits of graduate work may be used in partial satisfaction of the requirements for the undergraduate degree. If students earn at least a 3.00 in these classes, they are granted advanced standing in the master’s program and must then complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met, including a minimum of 18 credits taken for the master’s after the bachelor’s degree is complete.

Honors Programs

Physics majors who have maintained an overall GPA of at least 3.50 in physics courses and a GPA of 3.50 in all courses taken at Mason may apply to the physics honors program when they complete the first semester of their junior year. To graduate with honors in physics, a student is required to maintain a minimum GPA of 3.00 in physics courses and successfully complete PHYS 405 and 406 with a GPA of at least 3.50 and a grade of at least A- in PHYS 406.

Astronomy majors who have completed the prerequisites for ASTR 405 Honors Thesis in Astronomy, have a GPA of at least 3.50 in ASTR and PHYS courses taken at GMU, and have a GPA of at least 3.50 in all courses taken at GMU may apply for admission to the astronomy honors program. To graduate with honors in astronomy, a student must maintain a GPA of at least 3.50 in their ASTR/PHYS courses. Students accepted into the honors program must complete ASTR 405 and 406 with a GPA of at least 3.50 and a grade of A- or better in ASTR 406. Students in ASTR 405/406 will complete a research project and write a thesis working under the supervision of a faculty member. At the end of ASTR 406, the student will write a substantial thesis paper and make a presentation of results to their honors committee.

Writing-Intensive Requirement

Mason requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. Students majoring in Physics fulfill this requirement by successfully completing PHYS 407. Astronomy majors fulfill the requirement by completing ASTR 402. Computational and Data Sciences majors fulfill this requirement by completing CDS 302 or CDS 411.

Teacher Licensure

Students who wish to become teachers should consult the College of Education and Human Development chapter and attend an information session early in their undergraduate career. For more information, call 703-993-2078, e-mail gacline2@gmu.edu, or go to gse.gmu.edu.
Physics for Nonmajors

PHYS 243, 244, 245, and 246 are recommended for biology, geology, and premedical students, and mathematics students who seek a BA degree. PHYS 101, 102, 103, and 104 are intended for nonscience majors. PHYS 160, 161, 260, 261 or 265, 262, and 263 constitute a calculus-based sequence in general physics to be taken by physics and engineering majors, and chemistry, computer science, and mathematics students who are pursuing a BS degree. Students may receive credit for only one of the following three sequences: PHYS 243, 244, 245, 246; PHYS 103, 104; or PHYS 160, 161, 260, 261, 262, 263.

Graduate Programs

The School offers master's degrees in Applied and Engineering Physics, and in Computational Sciences. The School also administers the Energy and Sustainability concentration in the Interdisciplinary Studies, MAIS program. A graduate certificate is available in Computational Techniques and Applications.

The School also offers doctoral degrees in Computational Sciences and Informatics, and in Physics. These graduate programs are strongly supported by the extensive research activities of the School faculty, including many collaborations with scientists and engineers at regional government laboratories.

Undergraduate Degree

Astronomy, BS

Banner Code: SC-BS-ASTR

The BS in astronomy prepares students for graduate school, a career in research or teaching positions, or employment in industry, business, or education fields where analytical skills and a scientific background are advantageous. Students who are considering a double major should talk to the undergraduate coordinator. Note that at least 18 credits used to fulfill an astronomy BS cannot be used to fulfill another major or minor. Some course substitutions are allowed for double majors, but these must be approved by the department.

Students must fulfill all requirements for bachelor's degrees including university general education requirements. In addition, students must complete a total of 39 credits in physics and astronomy and 14 credits in mathematics with a minimum GPA of 2.00. Through the course work below, astronomy majors satisfy the university-wide requirements in natural science and quantitative reasoning. Also, by taking ASTR 402, astronomy majors satisfy the university’s writing-intensive requirement.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Degree Requirements

Required astronomy courses (9 credits):

- ASTR 103 - Astronomy Credits: 3 or ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3
- ASTR 328 - Stars and Interstellar Medium Credits: 3
- ASTR 402 - Methods of Observational Astronomy Credits: 3
Additional astronomy courses (6 credits)

Pick two of the following:
- ASTR 403 - Planetary Sciences Credits: 3
- ASTR 404 - Galaxies and Cosmology Credits: 3
- ASTR 428 - Relativity Credits: 3

Required physics courses (21 credits):

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1
- PHYS 303 - Classical Mechanics Credits: 3
- PHYS 305 - Electromagnetic Theory Credits: 3
- PHYS 308 - Modern Physics with Applications Credits: 3

Required math courses (14 credits):

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3

15 credits from the following:
(at least 12 credits must be from upper-level courses)

- ASTR 301 - Astrobiology Credits: 3
- ASTR 408 - Senior Research Credits: 3
- PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3
- PHYS 307 - Thermal Physics Credits: 3
- PHYS 402 - Introduction to Quantum Mechanics and Atomic Physics Credits: 3
- ASTR 403, ASTR 404 or ASTR 428, if not picked as additional astronomy courses, may be used here.
- Any other ASTR or PHYS course with the permission of the department
Areas of Emphasis

In meeting the above requirements, students may choose an area of emphasis. Students who wish to complete an emphasis should plan a program of study in consultation with their advisors. Some emphases listed below require more than 12 credits in the last category above. It is not necessary to complete an emphasis, as the base program provides full preparation for graduate school.

Emphasis in Astrobiology

This emphasis prepares students for careers in research, teaching, or science journalism. Students must take the following and complete a senior project or internship.

- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 506 - Selected Topics in Microbiology Credits: 1-4
- ASTR 408 - Senior Research Credits: 3 or ASTR 409 - Astronomy Internship Credits: 3

Emphasis in Computational Astronomy

This emphasis prepares students planning for computation and information-related jobs in industry and government labs. Students must take 9 credits of the following. In addition, they should complete a senior project or internship.

- ASTR 401 - Computer Simulation in Astronomy Credits: 3
- PHYS 251 - Introduction to Computer Techniques in Physics Credits: 3 or PHYS 510 - Computational Physics I Credits: 3
- MATH 446 - Numerical Analysis I Credits: 3 or MATH 447 - Numerical Analysis II Credits: 3
- ASTR 408 - Senior Research Credits: 3 or ASTR 409 - Astronomy Internship Credits: 3

Sample Schedule for Astronomy BS

(excluding general education courses)

First Semester

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- ENGH 101 - Composition Credits: 3
- ASTR 103 - Astronomy Credits: 3

Second Semester

- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
Third Semester

- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- MATH 213 - Analytic Geometry and Calculus III Credits: 3

Fourth Semester

- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1
- MATH 214 - Elementary Differential Equations Credits: 3

Fifth Semester

- ASTR 328 - Stars and Interstellar Medium Credits: 3
- PHYS 303 - Classical Mechanics Credits: 3
- PHYS 305 - Electromagnetic Theory Credits: 3
- ENGH 302 - Advanced Composition Credits: 3

Sixth Semester

- ASTR 404 - Galaxies and Cosmology Credits: 3
- PHYS 308 - Modern Physics with Applications Credits: 3

Seventh Semester

- ASTR 402 - Methods of Observational Astronomy Credits: 3
- ASTR 403 - Planetary Sciences Credits: 3
- ASTR 408 - Senior Research Credits: 3
- PHYS 402 - Introduction to Quantum Mechanics and Atomic Physics Credits: 3

Eighth Semester

- ASTR 428 - Relativity Credits: 3
- PHYS 307 - Thermal Physics Credits: 3

Computational and Data Sciences, BS

Banner Code: SC-BS-CDS
The BS degree in computational and data sciences (CDS) represents a new direction for integrated science at Mason based on the combination of applied mathematics, real-world computer science skills, data acquisition and analysis, and scientific modeling. Graduates of the BS program in CDS will possess the mathematical, scientific, and computational skills necessary to participate effectively as members of the interdisciplinary scientific simulation and analysis groups that are becoming more and more common in the public and the private sectors, particularly in Northern Virginia. Graduates will also be qualified to pursue graduate education in the sciences. Any student who meets the university’s general eligibility requirements may apply to the Computational and Data Sciences BS program.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements (28 credits). In addition, students must complete a total of 18 credits in CDS core courses, 1 credit in IT ethics, 8 credits in physics, 20 credits in mathematics, 3 credits in statistics, 21-25 credits in a science concentration (if the student chooses one of the science concentration options) or 20 science elective credits selected in consultation with the academic advisor (if the student does not choose any concentration), and 3-9 credits in computational and data sciences electives with a minimum GPA of 2.00. Through the course-work below, computational and data sciences majors satisfy the university-wide requirements in natural science and quantitative reasoning.

Students are also encouraged to undertake an optional research project that allows them to gain useful experience in the development of simulations and other aspects of computational and data sciences.

CDS 302 fulfills the university's writing-intensive requirement for the major.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Degree Requirements

Computational and Data Sciences Core (18 credits):

CDS 302 must be taken by all students

- CDS 302 - Scientific Data and Databases Credits: 3
  
  Plus five courses selected from the following:
  
  - CDS 101 - Introduction to Computational and Data Sciences Credits: 3
  - CDS 130 - Computing for Scientists Credits: 3
  - CDS 251 - Introduction to Scientific Programming Credits: 3
  - CDS 301 - Scientific Information and Data Visualization Credits: 3
  - CDS 401 - Scientific Data Mining Credits: 3
  - CDS 410 - Modeling and Simulations I Credits: 3
  - CDS 411 - Modeling and Simulations II Credits: 3

IT Ethics (1 credit):

- CDS 151 - Data Ethics in an Information Society Credits: 1
Mathematics (20 credits):

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3
- MATH 446 - Numerical Analysis I Credits: 3

Physics (8 credits):

Students complete one of the following sequences:

Sequence 1:
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

Sequence 2:
- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1

Computational and Data Sciences Electives (3–9 credits):

Choose 3-9 credits of CDS elective courses

Statistics (3 credits):

- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Science Electives (20–25 credits):

20 credits of science courses in consultation with the academic advisor

or

21-25 credits of course work from a concentration option.

Concentrations
A student may elect to take a particular set of courses from a concentration option in order to satisfy the science electives requirement of 20-25 credits. The concentration options include:

▲ Concentration in Biology (BIOL)

This concentration is appropriate for students who wish to pursue a career or graduate education that applies computational techniques to the simulation of biological processes and systems. To complete this concentration, students should take the following courses:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 305 - Biology of Microorganisms Credits: 3
- BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- BIOL 311 - General Genetics Credits: 4

Total: 25 credits

▲ Concentration in Chemistry (CHEM)

This concentration is intended for students who wish to pursue a career or graduate education that applies computers to the simulation of chemical processes and systems. To complete this concentration, students should take the following courses:

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3
- PHYS 246 - College Physics Lab Credits: 1
- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4

plus either:

- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2

or

- CHEM 331 - Physical Chemistry I Credits: 3
- CHEM 336 - Physical Chemistry Lab I Credits: 2

Total: 21 credits
Concentration in Physics (PHYS)

This concentration is designed for students who wish to pursue a career or graduate education that applies computational techniques to the simulation of physical problems. To complete this concentration, students should take the following courses:

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1

and any three of the following:

- PHYS 303 - Classical Mechanics Credits: 3
- PHYS 305 - Electromagnetic Theory Credits: 3
- PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3
- PHYS 307 - Thermal Physics Credits: 3
- PHYS 308 - Modern Physics with Applications Credits: 3
- PHYS 328 - Introduction to Astrophysics Credits: 3

Total: 21 credits

Physics, BS

Banner Code: SC-BS-PHYS

The BS in physics prepares students for graduate school and careers in education, business, or industry. Students in the fields of mathematics, science, and engineering who are considering a double major in physics should discuss this option with the undergraduate coordinator. Note that at least 18 credits used to fulfill a physics BS cannot be used to fulfill another major or minor. Some course substitutions are allowed for double majors, but these should be discussed in advance.

Students must fulfill all requirements for bachelor’s degrees including university general education requirements. In addition, students must complete a total of 45 credits in the major and 20 in mathematics, with a minimum GPA of 2.00, distributed as follows. Through the course work below, physics majors satisfy the university-wide requirements in natural science and quantitative reasoning, and the intensive writing requirement by taking PHYS 407.

Alternative Introductory Sequence

Normally, students who intend to major in physics should take the physics introductory sequence (PHYS 160, 161, 260, 261, 262, and 263). Students who decide to major in physics after completing PHYS 243, 244, 245, and 246 may do so but only with written permission of the School. Those students are required to take 4 additional credits in approved physics courses.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.
Degree Requirements

Physics Core Courses (27 credits)

Note: Students double majoring in engineering and physics may substitute ECE 305 for PHYS 305, and ECE 333/334 for PHYS 407.

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1
- PHYS 303 - Classical Mechanics Credits: 3
- PHYS 305 - Electromagnetic Theory Credits: 3
- PHYS 308 - Modern Physics with Applications Credits: 3
- PHYS 402 - Introduction to Quantum Mechanics and Atomic Physics Credits: 3
- PHYS 407 - Senior Laboratory in Modern Physics Credits: 3

Physics Electives (6 credits):

6 credits selected from the following:

- PHYS 251 - Introduction to Computer Techniques in Physics Credits: 3
- PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3
- PHYS 307 - Thermal Physics Credits: 3
- PHYS 405 or PHYS 406 - Honors Thesis in Physics Credits: 3
- PHYS 408 - Senior Research Credits: 2-3 or PHYS 409 - Physics Internship Credits: 3
- PHYS 416 - Special Topics in Modern Physics Credits: 1
- ASTR 328 - Stars and Interstellar Medium Credits: 3 or ASTR 428 - Relativity Credits: 3

Mathematics (20 credits):

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3
- MATH 313 - Introduction to Applied Mathematics Credits: 3 or MATH 413 - Modern Applied Mathematics I Credits: 3

Additional Science Courses (12 credits):
Choose 12 credits from the courses below:

- **PHYS 121 - Uses of Physics** Credits: 1
- **PHYS 122 - Inside Relativity** Credits: 1
- **PHYS 123 - Inside the Quantum World** Credits: 1
- **PHYS 124 - Experimental Explorations in Physics** Credits: 1
- **CS 112 - Introduction to Computer Programming** Credits: 4
- Additional approved upper-level physics, astronomy, chemistry, electrical engineering, or mathematics courses (for examples, see the areas of emphasis below)

**Areas of Emphasis**

In meeting all or part of the requirement for 12 credits of Additional Science Courses (above), students have the option of electing an emphasis. Students who wish to complete an emphasis should plan a program of study in consultation with their advisor. Suggested courses for each emphasis are listed below.

**Emphasis in Applied Solid State Physics (12 credits):**

This emphasis is for students who wish to pursue a career in the semiconductor industry. To complete this emphasis, students should take 12 credits selected from the following courses:

- **PHYS 512 - Solid State Physics and Applications** Credits: 3
- **ECE 430 - Principles of Semiconductor Devices** Credits: 3
- **ECE 431 - Digital Circuit Design** Credits: 3
  and one from the following:
- **PHYS 405 - Honors Thesis in Physics** Credits: 3
- **PHYS 406 - Honors Thesis in Physics** Credits: 3
- **PHYS 408 - Senior Research** Credits: 2-3
- **PHYS 409 - Physics Internship** Credits: 3

**Emphasis in Astrophysics (12 credits):**

This emphasis is for students who are planning to attend graduate school in astrophysics or pursue a career in industry. To complete this emphasis, students should take 12 credits selected from the following courses:

- **PHYS 428 - Relativity and Cosmology** Credits: 3
- **ASTR 328 - Stars and Interstellar Medium** Credits: 3
- **ASTR 404 - Galaxies and Cosmology** Credits: 3
- **ASTR 535 - Space Instrumentation and Exploration** Credits: 3
- **MATH 446 - Numerical Analysis I** Credits: 3
  students may also take one of the following:
- **PHYS 405 - Honors Thesis in Physics** Credits: 3
- **PHYS 406 - Honors Thesis in Physics** Credits: 3
- **PHYS 408 - Senior Research** Credits: 2-3
- **PHYS 409 - Physics Internship** Credits: 3

**Emphasis in Computational Physics (12 credits):**
This emphasis is for students who wish to pursue a career that applies computers to the solution of physical problems and data analysis. To complete this emphasis, students should take 12 credits selected from the following courses:

- PHYS 510 - Computational Physics I Credits: 3
- MATH 446 - Numerical Analysis I Credits: 3
- MATH 447 - Numerical Analysis II Credits: 3
- PHYS 405 - Honors Thesis in Physics Credits: 3
- PHYS 406 - Honors Thesis in Physics Credits: 3
- PHYS 408 - Senior Research Credits: 2-3
- PHYS 409 - Physics Internship Credits: 3

Emphasis in Electronics (12 credits):

This emphasis is for students who wish to pursue a career in industry, applying a strong background in electronics to physical problems. To complete this emphasis, students should take 12 credits selected from the following courses:

- ECE 301 - Digital Electronics Credits: 3
- ECE 333 - Linear Electronics I Credits: 3
- ECE 430 - Principles of Semiconductor Devices Credits: 3
- ECE 431 - Digital Circuit Design Credits: 3
- ECE 433 - Linear Electronics II Credits: 3
- PHYS 405 - Honors Thesis in Physics Credits: 3
- PHYS 406 - Honors Thesis in Physics Credits: 3
- PHYS 408 - Senior Research Credits: 2-3
- PHYS 409 - Physics Internship Credits: 3

Emphasis on Graduate School Preparation (12 credits):

Although any of the options listed here provide the successful student with a fully adequate background to enter graduate school, this emphasis is for students whose career goals definitely include graduate work in physics. To complete this emphasis, students should take 12 credits selected from the following courses:

- PHYS 410 - Computational Physics I Credits: 3
- PHYS 412 - Solid State Physics and Applications Credits: 3
- PHYS 440 - Nuclear and Particle Physics Credits: 3
- PHYS 405 - Honors Thesis in Physics Credits: 3
- PHYS 406 - Honors Thesis in Physics Credits: 3
- PHYS 408 - Senior Research Credits: 2-3
- PHYS 409 - Physics Internship Credits: 3

Emphasis in Medical Physics (12 credits):

Physics majors generally have an excellent acceptance record in applying to medical, dental, or veterinary schools. Although there is no formal set of courses within physics that is uniquely suitable, students should meet with a physics advisor and a health
sciences advisor for information about the university’s Medical Sciences Advisory Committee. For more information, call 703-993-1050.

Because schools in the health sciences vary both in their philosophies and specific requirements, it is wise for students to become aware of such information well in advance of applying for admission. Although specific requirements vary, most programs do require applicants to complete at least one year of biology. Other requirements generally include organic chemistry.

- CHEM 313 - Organic Chemistry Credits: 3
- CHEM 314 - Organic Chemistry Credits: 3
- CHEM 315 - Organic Chemistry Lab I Credits: 2
- CHEM 318 - Organic Chemistry Lab II Credits: 2
- PHYS 408 - Senior Research Credits: 2-3

Emphasis in Physics Education (24 credits):

This emphasis is intended for students wishing to pursue a career teaching secondary school physics. The goal of the program is to allow students to receive a license to teach physics in Virginia secondary schools within 120 credits. The following courses are required to qualify for the teaching license (EDRD 419 and either EDCI 473 or EDCI 483 fulfill 6 of the 12 credits of the Additional Science requirement, see above). In addition to the standard requirements for the physics major, students should enroll in 3 credits of directed study in physics laboratory instruction under PHYS 390.

- PHYS 390 - Topics in Physics Credits: 1-4 (physics laboratory instruction)
- EDCI 473 - Teaching Science in the Secondary School Credits: 3
- EDCI 483 - Advanced Methods of Teaching Science in Secondary School Credits: 3
- EDRD 419 - Literacy in the Content Areas Credits: 3
- EDCI 490 - Student Teaching in Education Credits: 6
- EDUC 372 - Human Development, Learning, and Teaching Credits: 3
- EDUC 422 - Foundations of Secondary Education Credits: 3
- pass the Praxis I and II exams

Sample Schedule for Physics BS

(excluding general education courses)

First Semester

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- PHYS 122 - Inside Relativity Credits: 1
- PHYS 123 - Inside the Quantum World Credits: 1

Second Semester

- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- CS 112 - Introduction to Computer Programming Credits: 4
Third Semester

- PHYS 251 - Introduction to Computer Techniques in Physics Credits: 3
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- MATH 213 - Analytic Geometry and Calculus III Credits: 3

Fourth Semester

- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1
- MATH 203 - Linear Algebra Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3

Fifth Semester

- PHYS/MATH elective
- PHYS 303 - Classical Mechanics Credits: 3
- PHYS 305 - Electromagnetic Theory Credits: 3
- MATH 313 - Introduction to Applied Mathematics Credits: 3

Sixth Semester

- PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3
  or
- PHYS 307 - Thermal Physics Credits: 3
- PHYS 308 - Modern Physics with Applications Credits: 3

Seventh Semester

- PHYS 402 - Introduction to Quantum Mechanics and Atomic Physics Credits: 3
- PHYS 407 - Senior Laboratory in Modern Physics Credits: 3
- PHYS 410 - Computational Physics I Credits: 3
- PHYS 416 - Special Topics in Modern Physics Credits: 1

Eighth Semester

- PHYS 408 - Senior Research Credits: 2-3
Undergraduate Interdisciplinary Minor

Renewable Energy Interdisciplinary Minor

Banner Code: RNRG

This college-wide interdisciplinary minor administered by the School of Physics, Astronomy and Computational Sciences is designed for students considering a career in the field of renewable energy, or as preparation for graduate work in a wide range of academic disciplines. Renewable energy, as normally understood, includes a variety of methods of energy generation, such as solar, wind, hydro, tidal, and geothermal, as well as energy storage methods and energy conservation. Jobs related to renewable energy lie in a wide range of areas including engineering, business, marketing, finance, installation, software, legal affairs, and research. Projections suggest that employment opportunities in the renewable energy field will increase dramatically in the near future. The renewable energy minor is therefore ideally suited for students with majors in engineering, business, and basic science.

The minor in renewable energy comprises 20 credits of course work. 8 credits must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Course Work

Core Courses (10 credits):

- PHYS 331 - Fundamentals of Renewable Energy Credits: 3
- PHYS 385 - Materials Science with Applications to Renewable Energy Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Physics (3 credits):

students take one of the following:

- PHYS 245 - College Physics Credits: 3
- PHYS 262 - University Physics III Credits: 3

Chemistry (4 credits):

students take one of the following:

- CHEM 211 - General Chemistry Credits: 4
- CHEM 212 - General Chemistry Credits: 4
- CHEM 251 - General Chemistry for Engineers Credits: 4
Internship (3 credits):

students take one of the following:

- PHYS 409 - Physics Internship Credits: 3 on renewable energy
- or a 3-credit internship focusing on renewable energy in another natural science or engineering field

Total: 20 credits

Undergraduate Minor

Astronomy Minor

Banner Code: ASTR

The minor requires completion of a physics prerequisite and 15 credits in astronomy, with a minimum GPA of 2.00. Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Course Work

Physics Prerequisite (8 or 12 credits)

In order to lay the groundwork for the astronomy courses, one of these physics sequences is essential for student success.

Students take either this sequence:

- PHYS 243 - College Physics Credits: 3
- PHYS 244 - College Physics Lab Credits: 1
- PHYS 245 - College Physics Credits: 3

or this sequence:

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1

Astronomy Core (8 credits):
- ASTR 111 - Introductory Astronomy: The Solar System Credits: 3
- ASTR 112 - Introductory Astronomy Lab: The Solar System Credits: 1
- ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3
- ASTR 114 - Introductory Astronomy Lab: Stars, Galaxies, and the Universe Credits: 1

Astronomy Electives (7 credits from the following):

- ASTR 301 - Astrobiology Credits: 3
- ASTR 302 - Foundations of Cosmological Thought Credits: 3
- ASTR 328 - Stars and Interstellar Medium Credits: 3
- ASTR 402 - Methods of Observational Astronomy Credits: 3
- ASTR 403 - Planetary Sciences Credits: 3
- ASTR 404 - Galaxies and Cosmology Credits: 3
- ASTR 428 - Relativity Credits: 3
- PHYS 122 - Inside Relativity Credits: 1
- PHYS 123 - Inside the Quantum World Credits: 1

Total: 15 credits

Computational and Data Sciences Minor

Banner Code: CDS

The minor in Computational and Data Sciences (CDS) provides an attractive option for students majoring in mathematics, science, or engineering who wish to augment their major degree program with additional courses in scientific computing. The combination of computer science, numerical methods, science, and CDS synthesis courses will significantly enhance the practical knowledge and computational skills of the students when compared with the major field alone. By absorbing the material in this curriculum, students will acquire the knowledge, skills, and techniques commonly used across scientific disciplines, which will allow them to apply their Mason education in a practical way in industrial, government, and academic settings.

At least 8 credits must be unique to this minor and may not be used to fulfill requirements of the student’s major, concentration, or another minor or undergraduate certificate. Students must complete at least 6 credits in their minor at Mason and achieve a minimum GPA of 2.00 in courses applied to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

The minor in CDS consists of 15 credits of course work. For additional information, please call 703-993-8402, fax 703-993-9300, or e-mail: kborne@gmu.edu

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Course Work
Students must take one of the following two courses:

- CDS 101 - Introduction to Computational and Data Sciences Credits: 3
- CDS 130 - Computing for Scientists Credits: 3

9 credits chosen from:

- Any CDS or CSI courses

3 credits chosen from:

- Any College of Science course at the 300 level or above. Other discipline-based courses may be permitted with permission of the undergraduate program director.

Total: 15 credits

Note:

Many of the courses listed above have additional prerequisites. Nonetheless, the CDS minor is within efficient reach of most students majoring in science, mathematics, engineering, or computer science, since these students will generally have the prerequisites for the classes listed above.

Physics Minor

Banner Code:  PHYS

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Course Work

The minor requires 18 credits with a minimum GPA of 2.00, 8 credits of which must be unique to the minor. For policies governing all minors, see the Academic Policies chapter of this catalog.

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1

Any two courses from:

- PHYS 303 - Classical Mechanics Credits: 3
Total: 18 credits

Bachelor's/Accelerated Master's Program

Physics, BS/Physics, Accelerated MS

This program allows academically strong undergraduates with a commitment to research to obtain BS and MS degrees by successfully completing 144 credits within five academic years plus summers their last two years. On completion, students are exceptionally well-prepared for entry into a professional school or a PhD program in physics or a related discipline. Well-prepared students are encouraged to apply to this program after they complete 90 credits. Admitted students take selected graduate courses during their senior year (when they have successfully completed prerequisites) and are able to use up to 6 graduate credits in partial satisfaction of requirements for the undergraduate degree. On completion and conferral of that degree and with satisfactory performance (3.00) in the graduate courses, students are given advanced standing in the master’s program and complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met. Contact the Physics undergraduate or graduate academic advisor for further details.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Master's Degree

Applied and Engineering Physics, MS

Banner Code: SC-MS-PHAE

This degree contains elements of traditional physics programs and the application of physics to a diversity of critical societal problems. The program is divided into three areas of emphasis. The standard emphasis is intended for students who may wish to pursue further graduate study in physics leading to a PhD degree in preparation for a career in basic research. The applied physics emphasis is intended for those who wish to apply the techniques and subject areas of physics to multifaceted problems encountered in the workplace, particularly in physics, engineering, computational science, and other related areas. The engineering physics emphasis allows students to select a larger number of courses from electrical engineering or nanotechnology and other areas.

Many courses are offered during late afternoon or evening hours to allow students with full-time employment to attend easily. Students employed at area high-technology organizations may take up to 6 credits (out of 30) for work done on the job under the guidance of a faculty member. This employment-related research may be conducted under an optional 3-credit research project or
an optional 6-credit master’s thesis. Master’s students who are not employed full time may apply for financial aid or a limited number of research assistantships.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

**Admission Requirements**

Individuals holding a baccalaureate degree in physics or a related field from an accredited institution and who earned a GPA of 3.00 (out of 4.00) in their last 60 credits are invited to apply for admission. If the baccalaureate degree is in a field other than physics, applicants should have taken several courses beyond the introductory physics courses, such as junior-level classical mechanics, electricity and magnetism, or electronics. Applicants may be required to make up one or two deficiencies, based on a graduate physics advisor’s assessment, and be provisionally admitted into the program. Three letters of recommendation must be submitted, preferably from former professors. The general GRE and the GRE subject test in physics are recommended for applicants who received their baccalaureate degrees within the past five years.

**Degree Requirements**

Candidates for the degree must successfully complete 30 credits in the categories shown below:

**6 credits of required core courses:**

- PHYS 684 - Quantum Mechanics I Credits: 3
- PHYS 685 - Classical Electrodynamics I Credits: 3

For the applied physics emphasis and the engineering physics emphasis, students may substitute:

- PHYS 502 - Introduction to Quantum Mechanics and Atomic Physics Credits: 3 (for PHYS 684)
- PHYS 513 - Applied Electromagnetic Theory Credits: 3 (for PHYS 685)

**15 credits in one of three emphases:**

**Standard Emphasis**

Students must take:

- PHYS 705 - Classical Mechanics Credits: 3
- PHYS 711 - Statistical Mechanics Credits: 3

Plus any 9 credits from this list
- PHYS 510 - Computational Physics I Credits: 3
- PHYS 512 - Solid State Physics and Applications Credits: 3
- PHYS 533 - Modern Instrumentation Credits: 3
- PHYS 540 - Nuclear and Particle Physics Credits: 3
- PHYS 575 - Atmospheric Physics I Credits: 3
- PHYS 611 - Electro-optics Credits: 3
- PHYS 612 - Physics of Modern Imaging Credits: 3
- PHYS 613 - Computational Physics II Credits: 3
- PHYS 614 - Thermodynamics and Kinetics of Materials Credits: 3
- PHYS 615 - Fundamentals of Materials Science Credits: 3
- PHYS 620 - Continuum Mechanics Credits: 3
- PHYS 630 - Introduction to Biophysics Credits: 3
- PHYS 660 - Space Weather Credits: 3
- PHYS 676 - Atmospheric Physics Credits: 3
- PHYS 684 - Quantum Mechanics I Credits: 3
- PHYS 685 - Classical Electrodynamics I Credits: 3
- PHYS 701 - Theoretical Physics Credits: 3
- PHYS 728 - Simulation of Large-Scale Physical Systems Credits: 3
- PHYS 736 - Computational Quantum Mechanics Credits: 3
- PHYS 760 - Space Plasma Physics Credits: 3
- PHYS 780 - Advanced Selected Topics in Physics Credits: 3
- PHYS 784 - Quantum Mechanics II Credits: 3
- PHYS 785 - Classical Electrodynamics II Credits: 3
- ASTR 532 - Phys Interplanetary Med Credits: 3
- ASTR 602 - Methods of Observational Astronomy Credits: 3
- ASTR 604 - Galaxies and Cosmology Credits: 3
- ASTR 628 - Relativity Credits: 3
- ASTR 660 - Plasma Physics for Space and Astrophysics Credits: 3
- ASTR 680 - Physics of Interstellar Media Credits: 3
- ASTR 730 - Stellar Astrophysics Credits: 3
- ASTR 761 - N-Body Methods and Part Sim Credits: 3
- ASTR 764 - Computational Astrophysics Credits: 3
- ASTR 765 - High-Energy and Accretion Astrophysics Credits: 3
- CSI 720 - Fluid Mechanics Credits: 3
- CSI 721 - Computational Fluid Dynamics I Credits: 3
- CSI 722 - Computational Fluid Dynamics II Credits: 3
- CSI 786 - Molecular Dynamics Modeling Credits: 3
- CSI 787 - Computational Materials Science Credits: 3

Total: 15 credits

Engineering physics emphasis
Students should take:

- PHYS 510 - Computational Physics I Credits: 3
- PHYS 533 - Modern Instrumentation Credits: 3
- 9 credits of ECE graduate courses

Total: 15 credits

Applied physics emphasis

Students should take:

- PHYS 510 - Computational Physics I Credits: 3
- PHYS 533 - Modern Instrumentation Credits: 3

plus any 9 credits from this list:

- ASTR 535 - Space Instrumentation and Exploration Credits: 3
- BINF 731 - Protein Structure Analysis Credits: 3
- BINF 741 - Introduction to Computer Simulations of Biomolecules Credits: 3
- CLIM 710 - Introduction to Physical Climate System Credits: 3
- CLIM 711 - Introduction to Atmospheric Dynamics Credits: 3
- CLIM 712 - Physical and Dynamical Oceanography Credits: 3
- CLIM 713 - Atmosphere-Ocean Interactions Credits: 3
- CLIM 714 - Land-Climate Interactions Credits: 3
- CLIM 715 - Numerical Methods for Climate Modeling Credits: 3
- CLIM 750 - Geophysical Fluid Dynamics Credits: 3
- CSI 742 - The Mathematics of the Finite Element Method Credits: 3
- CSI 763 - Statistical Methods in Space Sciences Credits: 3
- CSI 782 - Statistical Mechanics for Modeling and Simulation Credits: 3
- CSI 783 - Computational Quantum Mechanics Credits: 3
- ECE 521 - Modern Systems Theory Credits: 3
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
- ECE 548 - Sequential Machine Theory Credits: 3
- ECE 565 - Introduction to Optical Electronics Credits: 3
- ECE 584 - Semiconductor Device Fundamentals Credits: 3
- ECE 699 - Advanced Topics in Electrical and Computer Engineering Credits: 1-6
- PHYS 581 - Topics in Renewable Energy Credits: 3
- or any course listed in the Standard Emphasis

Total: 15 credits
9 credits of electives chosen from courses in:

- Physics, chemistry, mathematics, engineering, information technology, and computational sciences and informatics. No more than 6 credits may be chosen from areas outside ASTR, CSI, ECE, NANO, and PHYS. Elective credits can include a project or thesis.

- ECE 798 - Research Project Credits: 1-3
- ECE 799 - Master's Thesis Credits: 1-6
- PHYS 798 - Research Project Credits: 3
- PHYS 799 - Master's Thesis Credits: 1-6

Notes:

Students may choose to do either ECE/PHYS 798 Research Project (3 credits) or ECE/PHYS 799 Master’s Thesis (6 credits), but not both. The research project may be conducted at a student’s place of employment with the concurrence of a faculty advisor. The thesis is a more substantial piece of work performed under the supervision of a faculty member and requires students to make an oral defense. ECE/PHYS 798 may be taken only once. No more than 6 credits of PHYS 799 may be applied to the degree.

In addition to the requirements stated above, students may also select a research focus in astrophysics, atmospheric physics, biological applications of physics, computational physics, condensed matter, instrumentation (engineering physics), or nonlinear dynamics. A focus requires that students complete 15 credits of approved courses.

Students in the master’s degree program can earn a graduate certificate in computational techniques and applications from the School of Physics, Astronomy, and Computational Sciences by choosing an approved sequence of courses.

Total 30 credits

Sample course lists for various focus areas:

Astrophysics:

- PHYS 701 - Theoretical Physics Credits: 3
- PHYS 711 - Statistical Mechanics Credits: 3
- ASTR 680 - Physics of Interstellar Media Credits: 3

Atmospheric physics:

- PHYS 510 - Computational Physics I Credits: 3
- PHYS 676 - Atmospheric Physics Credits: 3
- CLIM 710 - Introduction to Physical Climate System Credits: 3
- CLIM 713 - Atmosphere-Ocean Interactions Credits: 3
Biophysics:
- PHYS 510 - Computational Physics I Credits: 3
- PHYS 630 - Introduction to Biophysics Credits: 3
- PHYS 711 - Statistical Mechanics Credits: 3
- BINF 731 - Protein Structure Analysis Credits: 3
- NEUR 751 - Applied Dynamics in Neuroscience Credits: 3

Computational physics:
- PHYS 510 - Computational Physics I Credits: 3
- PHYS 613 - Computational Physics II Credits: 3
- PHYS 780 - Advanced Selected Topics in Physics Credits: 3
- CSI 744 - Linear and Nonlinear Modeling in the Natural Sciences Credits: 3
- CSI 764 - Computational Astrophysics Credits: 3

Instrumentation/engineering physics:
- PHYS 510 - Computational Physics I Credits: 3
- PHYS 533 - Modern Instrumentation Credits: 3
- NANO 500 - Introduction to Nanomaterials and Interactions Credits: 3
- NANO 510 - Strategies for Nanocharacterization Credits: 3
- ECE 699 - Advanced Topics in Electrical and Computer Engineering Credits: 1-6

Material physics:
- PHYS 784 - Quantum Mechanics II Credits: 3
- PHYS 785 - Classical Electrodynamics II Credits: 3
- PHYS 711 - Statistical Mechanics Credits: 3
- PHYS 512 - Solid State Physics and Applications Credits: 3
- PHYS 614 - Thermodynamics and Kinetics of Materials Credits: 3

Nonlinear dynamics:
- PHYS 510 - Computational Physics I Credits: 3
- PHYS 701 - Theoretical Physics Credits: 3
- PHYS 705 - Classical Mechanics Credits: 3
- MATH 673 - Dynamical Systems Credits: 3
- NEUR 751 - Applied Dynamics in Neuroscience Credits: 3

Physics:
Computational Science, MS

Banner Code: SC-MS-COMP

The master’s program in computational science addresses the growing national and regional demand for trained computational scientists. It combines a solid foundation in information technology skills with computational courses in a variety of scientific areas. All courses are offered in the late afternoon or early evening to accommodate students with full-time employment outside the university.

The 30 credit hour curriculum is centered on a strong computational component, comprising 9 credits of core courses, with the remaining 21 credits taken in a broad range of scientific areas chosen from the different concentrations in the CSI PhD curriculum. This provides students with a flexible set of options that can be used to create their own customized curriculum under the guidance of a faculty advisor. Students are encouraged to undertake an optional master’s thesis or research project that allows them to gain useful experience in the development of simulations and other aspects of computational science.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Admission Requirements

Applicants should have academic backgrounds in physical or biological sciences, engineering, mathematics, or computer science. They should have an undergraduate degree from an accredited institution, with a GPA of at least 3.00 in their last 60 credits of study. In addition, applicants should have taken at least one course in differential equations and have facility in using a high-level computer programming language. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, a current résumé, and an expanded goals statement to the COS Fairfax Campus Graduate Admissions Processing Center. Applicants should also include three letters of recommendation and an official report of scores on the GRE-GEN. The GRE-SUB is recommended if it is given in the student’s undergraduate major. The GRE requirement will be waived if the student holds a master’s degree from a U.S. institution. TOEFL scores are required of all international applicants.

Degree Requirements

Candidates must successfully complete 30 credits as follows:

Three courses (9 credits) from the computational core, chosen from:

- CSI 700 - Numerical Methods Credits: 3
- CSI 701 - Foundations of Computational Science Credits: 3
- CSI 702 - High-Performance Computing Credits: 3
- CSI 703 - Scientific and Statistical Visualization Credits: 3
- CSI 710 - Scientific Databases Credits: 3
Computational electives (15 credits):

- 15 credits of CSI courses not including CSI 796, 798, 799, 898, 899, 991 and 996.

Scientific electives (6 credits):

- Two 3-credit courses approved by the student's advisor.
- Students can apply 6 credits of CSI 799 (master's thesis) or 3 credits of CSI 798 (research project) towards the elective requirement.

Total: 30 credits

Master's Level Certificate

Computational Techniques and Applications Graduate Certificate

Banner Code: SC-CERG-CTA

This certificate program focuses on mastering a variety of basic computational skills. The certificate is independent of the doctoral and master’s programs and is designed primarily for professionals in technical fields who seek to upgrade their computer expertise. This program is also available as an option for prospective or currently enrolled doctoral or master’s degree students.

The program comprises 15 credits of course work designed to provide an accelerated introduction to concepts in modern computation. Topics include operating systems, environments, languages, graphics, databases, and applications. Special course schedules may be designed depending upon the background and qualifications of the student.

Special course schedules may be designed depending upon the background and qualifications of the student. For example, some (or all) of the tool and techniques courses may be waived if the equivalent knowledge can be adequately demonstrated by the student. The waived credits are to be replaced with applications courses approved by the director of the certificate program. The recommended course sequence is tools and then applications.

The graduate certificate in computational techniques and applications may be pursued only on a part-time basis.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Admission Requirements

Applicants should have an academic background in physical or biological sciences, engineering, mathematics, or computer science. They should have an undergraduate degree from an accredited institution, with a GPA of at least 3.00 in their last 60 credits of study. In addition, applicants should have taken at least one course in differential equations and have facility in using a high-level computer programming language. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, and a current résumé to the COS Fairfax Campus Graduate Admissions Processing Center. TOEFL scores are required of all international applicants.
Certificate Requirements

The required 15 credits of course work is selected as follows:

Tools Courses (3-12 credits as needed) chosen from:

The tools courses are practical, skill-based courses covering specific software packages commonly used by scientists and engineers to solve problems. Depending on the student's background, 3-12 credit hours of tools courses are required. These courses are designed for professionals who are already familiar with other languages, packages and operating systems, but need a rapid introduction to specific software and mathematical methods used by scientists and engineers. One 3 credit tools course is required.

- CSI 500 - Computational Science Tools Credits: 3
- CSI 501 - Introduction to Scientific Programming Credits: 3
- CSI 600 - Quantitative Foundations for Computational Sciences Credits: 3
- CSI 700 - Numerical Methods Credits: 3

Applications Courses (minimum 3 credits)

The applications courses provide content from a specific scientific domain and demonstrate the utilization of techniques within the context. These courses are electives and can be selected from any CSI emphasis area. One 3 credit applications course is required.

- Any CSI courses excluding CSI 796, 798, 799, 898, 899 996, 991, 996 and the courses listed in the tools category

Total: 15 credits

Doctoral Degree

Computational Sciences and Informatics, PhD

Banner Code: SC-PHD-CSI

Founded in 1992, the computational sciences and informatics (CSI) doctoral program addresses the role of computation in science, mathematics, and engineering, and is designed around a core of advanced computer technology courses. Computational sciences is defined as the systematic development and application of computing systems and computational solution techniques for modeling and simulation of scientific and engineering phenomena. Informatics is defined as the systematic development and application of computing systems and computational solution techniques for analyzing data obtained through experiments, modeling, database searches, and instrumentation. The resulting interdisciplinary approach often leads to understanding that, in many cases, traditional theory or experimentation alone cannot provide. The close relationship of the CSI doctoral program to the research and development activities in federal laboratories, scientific institutions, and high-technology firms affords students opportunities for continued or new employment. Scheduled courses and sequences accommodate part-time students, with most courses meeting once a week in the late afternoon or early evening. The research and teaching activities associated with the CSI
program reflect the recognized role of computation as part of a triad with theory and experimentation, leading to a better understanding of nature.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Admission Requirements

Students interested in applying for admission into the CSI PhD program should have a bachelor’s degree in any natural science, mathematics, engineering, or computer science with a minimum GPA of 3.00 in their last 60 credits of study. All applicants to the PhD program should have a mathematics background up to and including differential equations. All applicants to the PhD program should also have knowledge of a computer programming language such as C, C++, FORTRAN, etc.

The GRE is required, unless the applicant holds a master’s degree from a school in the United States. A TOEFL score of 575 (paper-based exam) or 230 (computer-based exam) is required for international students. The ETS code for GMU is 5827.

Students should submit a completed graduate application along with three letters of recommendation, an expanded goals statement, and a $60 check to cover the application fee (payable to George Mason University) in addition to the items listed above.

Applications should be received by March 1 for fall semester and November 1 for spring semester. Applications requesting financial support must be received by February 1 for the fall semester. Please note that applications from local applicants may be accepted after these general deadlines.

Please send completed applications to the address below:

COS Graduate Applications Processing Center
George Mason University
4400 University Drive, MS 6A3
Fairfax, VA 22030

For additional information, phone 703-993-1998; fax 703-993-9300, or e-mail: blaisten@gmu.edu.

Reduction of Credit

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

Program of Study

The list of research areas tells only part of the story because the greatest strength of the CSI doctoral program lies in its ability to foster and promote truly interdisciplinary research that crosses traditional domain boundaries. In the CSI doctoral program, each student is presented with an exciting opportunity to create a new area of interdisciplinary inquiry that would not fit into a traditional PhD program. Students in the CSI doctoral program use computationally intensive methods to solve current problems in these scientific areas.

Degree Requirements

The 72-credit doctoral program combines three intellectual elements:

- Core computational science topics
- Computational intensive courses in specific scientific areas
Research leading to the dissertation

The doctoral program, designed to be completed in 4 to 5 years, includes the following requirements:

- 12 credits of core computational courses (scientific computing, databases, visualization)
- 33 credits of computational courses with at least 24 credits of CSI courses
- 3 credits in colloquium/seminar
- 24 credits in dissertation research

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

**Doctoral Course Work (48 credits)**

**General Core Courses (12 credits):**

Select from the following:

- CSI 700 - Numerical Methods Credits: 3
- CSI 701 - Foundations of Computational Science Credits: 3
- CSI 702 - High-Performance Computing Credits: 3
- CSI 703 - Scientific and Statistical Visualization Credits: 3
- CSI 710 - Scientific Databases Credits: 3

**Areas of Emphasis (33 credits)**

Students are advised to choose one of the research areas listed below. Students may also pursue interdisciplinary research that combines the areas of emphasis listed above with each other and also with quantum information science, climate dynamics, bioinformatics, and computational neuroscience.

The School of Physics, Astronomy, and Computational Sciences offers several weekly colloquia and seminar series to ensure that students are exposed to the latest developments at area research institutions. Doctoral students are encouraged to participate in national and international meetings where they can present their latest findings.

Students are required to take 33 credits of science courses with at least 24 credits of CSI courses. Lists of courses that set the foundations for each research area are provided as guideline only.

**Computational Fluid Dynamics**

- CSI 720 - Fluid Mechanics Credits: 3
- CSI 721 - Computational Fluid Dynamics I Credits: 3
- CSI 722 - Computational Fluid Dynamics II Credits: 3
- CSI 742 - The Mathematics of the Finite Element Method Credits: 3

plus one from:

- CSI 685 - Fundamentals of Materials Science Credits: 3
• CSI 729 - Topics in Continuum Systems Credits: 3
• CSI 780 - Computational Physics and Applications Credits: 3
• CSI 786 - Molecular Dynamics Modeling Credits: 3
• CSI 787 - Computational Materials Science Credits: 3
• CSI 789 - Topics in Computational Physics Credits: 3 (when topic is Mechanics of Solids)

Computational Materials and Physical Chemistry Sciences

• CSI 685 - Fundamentals of Materials Science Credits: 3
• CSI 780 - Computational Physics and Applications Credits: 3
• CSI 782 - Statistical Mechanics for Modeling and Simulation Credits: 3
  or
• CSI 783 - Computational Quantum Mechanics Credits: 3
• CSI 787 - Computational Materials Science Credits: 3

plus one from:

• CSI 786 - Molecular Dynamics Modeling Credits: 3
• CSI 789 - Topics in Computational Physics Credits: 3 (when topic is Mechanics of Solids)
• CSI 885 - Atomistic Modeling of Materials Credits: 3

Space Sciences and Computational Astrophysics

• PHYS 685 - Classical Electrodynamics I Credits: 3
• CSI 661 - Stellar Astrophysics Credits: 3
  or
• CSI 662 - Introduction to Space Weather Credits: 3
• CSI 781 - Plasma Science Credits: 3
  or
• CSI 764 - Computational Astrophysics Credits: 3

plus two from:

• CSI 721 - Computational Fluid Dynamics I Credits: 3
• CSI 763 - Statistical Methods in Space Sciences Credits: 3
• CSI 780 - Computational Physics and Applications Credits: 3
• CSI 782 - Statistical Mechanics for Modeling and Simulation Credits: 3
• CSI 783 - Computational Quantum Mechanics Credits: 3

Computational Mathematics

• CSI 740 - Numerical Linear Algebra Credits: 3
• CSI 742 - The Mathematics of the Finite Element Method Credits: 3
• CSI 747 - Nonlinear Optimization and Applications Credits: 3
• CSI 771 - Computational Statistics Credits: 3
• CSI 786 - Molecular Dynamics Modeling Credits: 3

Computational Physics

• CSI 780 - Computational Physics and Applications Credits: 3
• CSI 782 - Statistical Mechanics for Modeling and Simulation Credits: 3
• CSI 783 - Computational Quantum Mechanics Credits: 3

plus two from:

• CSI 781 - Plasma Science Credits: 3
• CSI 786 - Molecular Dynamics Modeling Credits: 3
• CSI 787 - Computational Materials Science Credits: 3
• CSI 788 - Simulation of Large-Scale Physical Systems Credits: 3

Computational Statistics

• CSI 771 - Computational Statistics Credits: 3

• CSI 773 - Statistical Graphics and Data Exploration Credits: 3
  or
• CSI 876 - Measure and Linear Spaces Credits: 3
  or
• CSI 971 - Probability Theory Credits: 3

• CSI 972 - Mathematical Statistics I Credits: 3
• CSI 973 - Mathematical Statistics II Credits: 3

Computational Learning

• CSI 771 - Computational Statistics Credits: 3
• CSI 772 - Statistical Learning Credits: 3
• CSI 773 - Statistical Graphics and Data Exploration Credits: 3
• CSI 777 - Principles of Knowledge Mining Credits: 3  
• CSI 873 - Computational Learning and Discovery Credits: 3

Colloquium/Seminar (3 credits)

3 credits from CSI 898 or CSI 991 (courses may be repeated).

• CSI 898 - Research Colloquium in Computational Sciences and Informatics Credits: 1  
• CSI 991 - Seminar in Scientific Computing Credits: 1

Interdisciplinary Studies

Students may also pursue interdisciplinary research that combines the areas of emphasis listed above with each other and also with geoinformation sciences, remote sensing, computational chemistry, climate dynamics, and bioinformatics, several of which are autonomous PhD programs within COS.

Candidacy Examination

The student must successfully complete separate written, computational, and oral candidacy examinations prepared and administered by the dissertation committee.

Dissertation Proposal and Advancement to Candidacy

Students advance to doctoral candidacy by fulfilling the following requirements:

• The student must successfully complete candidacy examinations as stated above.
• The student prepares a dissertation proposal describing in detail the planned dissertation research. The proposal must be approved by the dissertation committee.
• Following successful completion of the research proposal and candidacy exams, the committee will recommend the student for advancement to doctoral candidacy.

Doctoral Research (24 credits)

No more than 24 combined credits from CSI 998 and CSI 999 may be applied toward satisfying doctoral degree requirements, with no more than 12 credits of CSI 998.

• CSI 998 - Doctoral Dissertation Proposal Credits: 1-12  
• CSI 999 - Doctoral Dissertation Credits: 1-12 (minimum 3 credits at first registration)

Dissertation Research and Defense

After advancing to candidacy, the student will work on a doctoral dissertation while enrolled in CSI 999. The dissertation is a written piece of original mathematics that demonstrates a doctoral candidate’s mastery of the subject matter. A student is expected to produce new and original research worthy of publication in a peer-reviewed journal. After the dissertation is completed, the committee will review the dissertation and examine the student in a public oral dissertation defense.
Total: 72 credits

Academic Common Market

The CSI PhD degree has been approved for access by residents of Maryland through the Academic Common Market (ACM). The ACM allows full-time students who are certified residents of Maryland to enroll in the CSI PhD program while paying the Virginia in-state tuition rate, which is about one-third of the out-of-state tuition rate that residents of Maryland would otherwise have to pay. Details regarding Maryland’s participation in the ACM may be found at www.mhec.state.md.us/index.asp. The ACM program code for the CSI Doctoral Program is 300801. Interested students should contact the Office of the University Registrar, Certifications Services, at 703-993-2448.

Physics, PhD

Banner Code: SC-PHD-PHYS

All doctoral students accepted into the physics PhD program take a common core of four courses (see below). By working with the Dissertation Committee, a student may choose to specialize in an emphasis area such as astrophysics, biophysics, nonlinear physics, planetary sciences, material physics, space weather physics, or others according to his or her particular interests. By the end of their first year, all students should pair with a faculty advisor who will guide them toward doctoral candidacy.

This program of study is offered by the School of Physics, Astronomy, and Computational Sciences in the College of Science.

Admission Requirements

Those holding a baccalaureate degree in physics or astronomy from an accredited institution, who earned a GPA of 3.00 (out of 4.00) in their last 60 credits, and received acceptable scores on the GRE-GEN are invited to apply for admission. Three letters of recommendation must be submitted, preferably from former professors. The GRE subject test in physics is recommended for all interested applicants who received their baccalaureate degrees within the past five years. A degree-seeking graduate applicant with a baccalaureate degree who has not met all admission requirements may be offered provisional admission if sufficient evidence is presented to suggest the applicant has the ability to pursue graduate work. For more details concerning admission requirements to George Mason University, please refer to the Graduate Admission Policies and Admission of International Students sections of this catalog.

Reduction of Credit

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

Degree Requirements

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

All students in the physics PhD program must earn a minimum of 72 graduate credits. Of these, 48 are required course work and preliminary research credits, and 24 are doctoral dissertation proposal and doctoral dissertation research credits. For students entering the doctoral program with a master's degree in physics or a related field, or relevant graduate course work, the 48 credit requirement may be reduced by a maximum of 30 credits.
Doctoral Course Work (48 credits)

Physics Core (12 credits)

Note: the doctoral candidacy (qualifying) examination is based on the topics covered in these four core courses.

- PHYS 684 - Quantum Mechanics I Credits: 3
- PHYS 685 - Classical Electrodynamics I Credits: 3
- PHYS 705 - Classical Mechanics Credits: 3
- PHYS 711 - Statistical Mechanics Credits: 3

Qualifying Examination

The qualifying examination is offered once per year and is divided into four sections corresponding to the four topics in the core courses (Quantum Mechanics, Electromagnetic Theory, Classical Mechanics, and Statistical Mechanics). All students must successfully pass all four sections of the qualifying examination before the end of their third year. Grades of “Pass” or “Unsatisfactory” will be given individually for the four separate sections of the exam. If students receive a grade of “Unsatisfactory” in a given section of the exam, they will be allowed to retake that section a maximum of two times. Students can choose to take a particular section or a combination of sections at one sitting, but they must successfully pass all sections by the end of their third year.

Students entering the program with equivalent courses taken at another institution can satisfy the core requirement by taking the qualifying exam directly. Each section of the qualifying exam has written and oral components. The student must satisfactorily pass both components of the exam. The oral component may be waived by unanimous consent of the Qualifying Examination Committee based on exceptional performance on the written component. At the beginning of each academic year, the program director will appoint members to the Qualifying Examination Committee, and this committee is responsible for creating and grading the qualifying exam offered that year.

Dissertation Committee and Program of Study

After the successful completion of the qualifying examinations, a Dissertation Committee should be formed as soon as possible. This committee consists of a graduate faculty member from the Department of Physics and Astronomy and at least two other members of the graduate faculty, one of whom must be from outside the Department. The composition of the committee must be approved by the program director. The Dissertation Committee is responsible for directing the student in their chosen field of research. The student should work closely with their committee to select specialty courses and electives that form a cohesive program of study.

Specialty Science Courses (6 credits)

6 credits of approved physics or astronomy specialty courses.

General Science Electives (27 credits)

27 credits of approved general electives, which may be chosen from physics and astronomy, or other related disciplines.

Seminar (3 credits)
taken 3 times:

- PHYS 703 - Seminar in Physics Credits: 1

Advancement to Candidacy

Before a student may be advanced to doctoral candidacy, they need to complete all required course work, pass the qualifying examination, and been recommended by their committee. Advancement to doctoral candidacy implies that the student has demonstrated adequate breadth and depth of knowledge in the field of study and is capable of conducting research on the boundaries of knowledge.

Dissertation Research (24 credits)

Note: no more than 24 combined credits from PHYS/ASTR 998 and PHYS/ASTR 999 may be applied toward satisfying doctoral degree requirements, with no more than 12 credits of PHYS/ASTR 998.

- ASTR 998 - Doctoral Dissertation Proposal Credits: 1-12
- ASTR 999 - Doctoral Dissertation Credits: 1-12
- PHYS 998 - Doctoral Dissertation Proposal Credits: 1-12
- PHYS 999 - Doctoral Dissertation Credits: 1-12

Doctoral Dissertation

After advancing to doctoral candidacy, the student works with their Dissertation Committee to develop their preliminary research into a doctoral dissertation. The dissertation research should represent a significant contribution to its scientific field and should be deemed publishable in a refereed scientific journal. The dissertation must be defended in a public forum before the Dissertation Committee and other interested faculty.

Total: 72 credits

■ School of Systems Biology

Phone: 703-993-8400
Web: ssb.gmu.edu

Faculty

Professors: Bailey (distinguished), Jafri, Kashanchi, Liotta, Petricoin, Popov, Seto, Soyfer (distinguished university professor), Vaisman (Associate Director), Willett (Acting Director), Wu

Associate professors: Baranova, Christensen, Cox, Fryxell, Grant, Kinser, Klimov

Assistant professors: Hakami, Kehn-Hall, Luchini, van Hoek

Adjunct faculty: Pitt, Solka
Affiliate faculty: Baxevanis, Bokhari, Camphausen, Carr, Cooper, Grefenstette, Ikonomi, Kim, Lipsky, Masso, Marr, Matson, Matthews, Monroe, Reck, Sobie, Van Tassell, Ward, Williams

Emeritus: Isbister, Royt

The School of Systems Biology results from the merger of the Department of Molecular and Microbiology with the Department of Bioinformatics and Computational Biology. The School offers undergraduate and graduate degree programs in bioinformatics, and graduate degree programs in biology and bioscience. The School also offers research opportunities at the graduate and undergraduate levels. For additional details about current faculty research activities, please visit the School's website, ssb.gmu.edu.

Course Work

The School offers all graduate and undergraduate course work designated BINF and BIOS in the Courses chapter of this catalog, as well as all BIOL graduate courses.

Other Undergraduate Programs

The School of Systems Biology works closely with and provides faculty and administrative support to the Biology Undergraduate Program, through which the BA and BS degrees in Biology are offered. Refer to the Biology Undergraduate Program section for more information on bachelor's degrees in Biology.

Policy on Using Laboratories

Only authorized experiments and exercises may be carried out in the School's research and teaching laboratories and must be done under the supervision of a university faculty or staff member. No unauthorized work is allowed in any laboratory.

Policy on Using Organisms in Classes

Direct observations of actual organisms are considered an essential part of learning biology at all levels. Direct observations of organisms may involve the use of living or preserved specimens, dissections of organisms or parts of organisms, and microscopic examination of organisms or parts of organisms. All use of live animals conforms to National Institutes of Health guidelines for the use and care of laboratory animals. Activities specified above may be a required part of a course and thus serve as a basis for grading in the course. Any questions about the administration of this policy should be directed to the course coordinator or instructor.

Biology, Bachelor's/Accelerated Master's Degree

Qualified undergraduates may be admitted to an accelerated master’s program and obtain both a BS and an MS within an accelerated time frame. This program is open only to those students who wish to pursue the master’s degree concentrations in microbiology or molecular biology. Students admitted to this program may take graduate courses after completing 90 undergraduate credits, and up to 6 credits of graduate work may be used in partial satisfaction of the requirements for the undergraduate degree. If students earn at least a 3.00 in these classes, they are granted advanced standing in the master’s program and must then complete an additional 24 credits to receive the master’s degree. All other master’s degree requirements must be met, including a minimum of 18 credits taken for the master’s after the bachelor’s degree is completed.

Students with an overall GPA of at least 3.00 may apply for provisional acceptance to the accelerated master’s program after completing BIOL 213, 303, 304, 305/306, 307, and 311; and CHEM 315 and 318; or after completing 75 undergraduate credits including BIOL 494. Three letters of recommendation, including one from a prospective thesis or project advisor, are required.
After completing 120 credits and all requirements for the bachelor’s degree and filing the Graduation Intent Form, students are awarded a bachelor’s degree. Accelerated master’s students must then submit scores on the GRE general exam to have the provisional qualifier removed. Ordinarily, students should receive a minimum combined score of 1,100 on the verbal and quantitative portions of the exam.

**Undergraduate Minor**

**Bioinformatics Minor**

*Banner Code: BNF*

The bioinformatics minor is an interdisciplinary program consisting of required courses in biology, programming, statistics, and bioinformatics. Eight credits of course work must be unique to the minor. For policies governing all minors, see the Academic Policies section of this catalog.

This program of study is offered by the School of Systems Biology in the College of Science.

**Course Work**

Students must complete the following courses (either 20 or 22 credits) with a minimum GPA of 2.00, distributed as follows:

- BINF 401 - Bioinformatics and Computational Biology I Credits: 3
- BINF 402 - Bioinformatics and Computational Biology II Credits: 3
- BIOL 213 - Cell Structure and Function Credits: 4
- BIOL 482 - Introduction to Molecular Genetics Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3
  or
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- CS 112 - Introduction to Computer Programming Credits: 4
  or
- IT 108 - Programming Fundamentals Credits: 3
  and
- IT 306 - Program Design and Data Structures Credits: 3

Total: 20 or 22 credits

**Master's Degree**

**Bioinformatics and Computational Biology, MS**

*Banner Code: SC-MS-BCB*
This degree addresses the growing national and regional demand for trained computational biologists. It combines a solid foundation in biotechnology with the computational skills required for bioinformatics. The flexibility of the degree structure permits students to custom design their curriculum under an advisor’s guidance, making the MS in bioinformatics especially relevant for students employed in today’s diverse biotechnology workplace. Students completing the program are qualified to pursue careers that require knowledge of current bioinformatics methods and the ability to develop new bioinformatics software.

Courses are generally offered in the late afternoon or early evening to accommodate students with full-time employment outside the university. Students employed at area biotechnology organizations may take up to 6 credits (out of 31) for bioinformatics work done on the job, under the guidance of a faculty member. This work-related project may be applied as either a 3-credit research project or a 6-credit master’s thesis.

This program of study is offered by the School of Systems Biology in the College of Science.

**Admission Requirements**

Applicants should have a bachelor’s degree in biology, computer science, or a related field, with a GPA of at least 3.00 in their last 60 credits of study. Applicants should have taken courses in molecular biology, computer science, calculus, physical chemistry, and statistics. Students with deficiencies in one or more of these areas may be required to take additional courses from the undergraduate curriculum. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, a current résumé, and an expanded goals statement to the COS Graduate Admissions Processing Center. Applicants should also include three letters of recommendation and an official report of scores obtained on the GRE-GEN exam. The GRE requirement will be waived if the student holds a master’s degree from a U.S. institution. TOEFL scores are required for all international applicants.

**Degree Requirements**

Candidates must successfully complete 31 credits as follows:

**Bioinformatics core courses (12 credits):**

- BINF 630 - Bioinformatics Methods Credits: 3
- BINF 631 - Molecular Cell Biology for Bioinformatics Credits: 3
- BINF 634 - Bioinformatics Programming Credits: 3
- BINF 734 - Advanced Bioinformatics Programming Credits: 3

**Advanced bioinformatics (3 credits):**

- 3 credits of advanced bioinformatics courses numbered BINF 730 and above

**Electives (12 or 9 credits):**

- 12 credits of electives in bioinformatics and computational biology, biology and biotechnology, or computational sciences, as approved by the advisor
- Utilization of the 6-credit MS thesis option reduces the electives requirement from 12 credits to 9 credits.

**Bioinformatics seminar (1 credit):**
• BINF 704 - Colloquium in Bioinformatics Credits: 1

Research component (3 or 6 credits):

Students must complete either a 3-credit research project or a 6-credit MS thesis. Utilization of the 6-credit MS thesis option reduces the electives requirement from 12 credits to 9 credits.

• BINF 798 - Research Project Credits: 3
or
• BINF 799 - Master's Thesis Credits: 1-6

Total: 31 credits

Bioinformatics Management, MS

Banner Code: SC-MS-BNFM

This degree addresses the regional and national need for technically trained managers who will be able to lead teams of bioinformaticians in both the public and private sectors. The degree combines a solid foundation in bioinformatics research, tools, and techniques, with the management skills needed to address the associated legal, ethical, managerial, and business issues. The MS in bioinformatics management is intended for:

• Students seeking advancement in their current bioinformatics careers that requires an advanced degree in bioinformatics combined with management expertise.
• Students with a general background in biological science or computational methods who are planning to enter the field of bioinformatics as managers and would like to strengthen their bioinformatics and managerial expertise.

This program of study is offered by the School of Systems Biology in the College of Science.

Admission Requirements

Applicants should have a bachelor’s degree in biology, computer science, or a related field, with a GPA of at least 3.00 in their last 60 credits of study. Applicants should have taken courses in molecular biology, computer science, calculus, physical chemistry, and statistics. Students with deficiencies in one or more of these areas may be required to take additional courses from the undergraduate curriculum. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, a current résumé, and an expanded goals statement to the COS Graduate Admissions Processing Center. Applicants should also include three letters of recommendation and an official report of scores obtained on the GRE-GEN exam. The GRE requirement will be waived if the student holds a master’s degree from a U.S. institution. TOEFL scores are required of all international applicants.

Degree Requirements

Candidates must successfully complete 30 credits as follows:
Bioinformatics Core Courses (15 credits)

Foundational courses in modern biotechnology, tools and methods for bioinformatics analysis, and methods for creating customized bioinformatics tools.

- BINF 630 - Bioinformatics Methods Credits: 3
- BINF 631 - Molecular Cell Biology for Bioinformatics Credits: 3
- BINF 634 - Bioinformatics Programming Credits: 3
- BINF 730 - Biological Sequence and Genome Analysis Credits: 3

One of the following:

- BINF 633 - Molecular Biotechnology Credits: 3
- BINF 636 - Microarray Methodology and Analysis Credits: 3
- BINF 650 - Introduction to Bioinformatics Database Design Credits: 3

Management Core Courses (12 credits)

Foundational courses in management theory related directly to the management of scientific programs and personnel.

- MBA 638 - Operations Management Credits: 3
- MBA 712 - Project Management Credits: 3
- TECM 615 - Decision Making Using Accounting and Financial Data Credits: 3
- TECM 640 - Management of Consulting and Technical Professionals Credits: 1-3

Capstone research project (3 credits)

Focusing on bioinformatics management issues and techniques.

- BINF 798 - Research Project Credits: 3

Total: 30 credits

Biology, MS

Banner Code: SC-MS-BIOL

This program provides advanced training for college graduates or professionals seeking careers in the biotechnology industry or biodefense, as well as more traditional careers in biomedical research, teaching, evolutionary biology, and animal biology. Master’s level concentrations are available in molecular biology (MOB), microbiology and infectious disease (MID), bioinformatics and computational biology (BCB), and systematics and evolutionary biology (SEB). Alternatively, students may choose the program in general biological sciences, which allows flexibility to specialize in additional areas.
This program of study is offered by the School of Systems Biology in the College of Science.

**Admission Requirements**

Applicants must have a bachelor’s degree in biology or its equivalent, with the exception of those applying to the bioinformatics and computational biology (BCB) concentration. All MS concentrations require a GPA of 3.00 in biology course work or in the last 60 credits of undergraduate study. Students must also submit three letters of recommendation and scores on the general GRE. Successful applicants usually score at least 1,100 on the verbal and quantitative sections of the GRE. Admission is contingent on acceptance by a faculty research advisor.

Students who choose the BCB concentration must have an undergraduate degree in any natural science, mathematics, engineering or computer science. It is preferred that students who choose the BCB concentration have some undergraduate course work in cell biology, molecular biology, genetics and biochemistry (two to four upper-division courses), plus some undergraduate course in computer science (two to four courses that include substantial programming projects). Students without this background may be asked to remedy their deficiencies.

Students who choose the concentration in microbiology and infectious disease must have a lecture and lab course in microbiology and a lecture course in biochemistry.

**Degree Requirements**

Candidates for the master's of science in biology focus their study in one of four approved concentrations or by completing course work in an area of study chosen in consultation with the student's advisor and program director.

**Program of Study**

An advisory committee and the student work together to develop a program of study that best fits the student’s background and interests. At least one member of the committee must be faculty in the School of Systems Biology. The student must submit a program of study to the program director for approval within the first 12 credits of graduate work and must complete at least 30 graduate credits.

**Thesis or Research Project Option**

Students have the option to complete a 3-6 credit master's thesis (BIOL 799) or a 1-3 credit research project (BIOL 798). In accordance with Mason graduate policies, the same quality of work is expected of students regardless of which option they choose.

**Thesis Option**

In general, the MS thesis is most appropriate for students planning or considering a research career. Students pursuing the thesis option must write a formal thesis that meets the requirements of the graduate school and must defend their thesis and present their results in a public seminar.

**Project Option**

The MS project is most appropriate for students who have scheduling commitments, such as a full-time job, that may preclude performing a complete series of laboratory experiments. Students pursuing the project option must successfully complete written and oral comprehensive exams.
Students in the molecular biology (MOB), microbiology and infectious disease (MID), and the bioinformatics and computational biology (BCB) concentrations are required to present one research paper at a meeting or conference any time before graduation.

Program in Biological Sciences

This program is for students who wish to specialize in an area not covered by the concentrations described below.

1–3 credits of research methodology:

- BIOL 690 - Introduction to Graduate Studies in Biology Credits: 1-2
  or
- BIOS 702 - Research Methods Credits: 3

2 credits of seminar:

- BIOL 692 - Seminar in Biology Credits: 1
  or
- BIOL 695 - Seminar in Molecular, Microbial, and Cellular Biology Credits: 1

1–6 credits of research:

- either 1-3 credits of BIOL 798 - Master's Research Project Credits: 1-3
  or 3-6 credits of BIOL 799 - Thesis Credits: 1-6

19–26 credits of electives:

- 19–26 credits of electives in BIOL, BIOS, or related areas as approved by the student’s advisor and the program director

Total: 30 credits

Concentrations

Master’s level concentrations are available in molecular biology (MOB); microbiology and infectious disease (MID); bioinformatics and computational biology (BCB), and systematics and evolutionary biology (SEB). The BCB, MOB, and SEB concentrations each require 2-4 credits of molecular techniques courses as explained below.

Molecular Techniques Requirement
Students in the BCB, MOB, and SEB concentrations must satisfy the molecular techniques requirement by taking 2-4 credits of BIOL 668 or BIOS 740. Special topics courses, such as BIOL 575 or 691, may also be approved for this requirement by the program director, but only in semesters in which they are primarily a laboratory course of at least two credits with substantial content of techniques in molecular biology.

▲ Concentration in Bioinformatics and Computational Biology (BCB)

1–3 credits of research methodology:

- BIOL 690 - Introduction to Graduate Studies in Biology Credits: 1-2
- BIOS 702 - Research Methods Credits: 3

12 credits of core biology:

- BIOL 580 - Computer Applications for the Life Sciences Credits: 3
- BINF 630 - Bioinformatics Methods Credits: 3
- BINF 634 - Bioinformatics Programming Credits: 3
- BIOS 741 - Genomics Credits: 3
- BINF 730 - Biological Sequence and Genome Analysis Credits: 3
- BINF 731 - Protein Structure Analysis Credits: 3

2–4 credits of molecular techniques:

- 2–4 credits of courses satisfying the Molecular Techniques requirement

2 credits of seminar:

- BIOL 695 - Seminar in Molecular, Microbial, and Cellular Biology Credits: 1

1–6 credits of research:

- either 1-3 credits of BIOL 798 - Master's Research Project Credits: 1-3
- or 3-6 credits of BIOL 799 - Thesis Credits: 1-6
3-12 credits of electives:

- 3–12 credits in BIOL, BIOS, or related areas as approved by the student’s advisor and the program director

Total: 30 credits

▲ Concentration in Microbiology and Infectious Disease (MID)

1–3 credits of research methodology:

- BIOL 690 - Introduction to Graduate Studies in Biology Credits: 1-2
  or
- BIOS 702 - Research Methods Credits: 3

12 credits of core biology:

Choose four courses from the following:

- BIOL 553 - Advanced Topics in Immunology Credits: 3
- BIOL 563 - Virology Credits: 3
- BIOL 669 - Pathogenic Microbiology Credits: 3
- BIOL 715 - Microbial Physiology Credits: 3
- BIOL 718 - Techniques in Microbial Pathogenesis Credits: 3

2 credits of seminar:

- BIOL 695 - Seminar in Molecular, Microbial, and Cellular Biology Credits: 1

1–6 credits of research:

- either 1-3 credits of  BIOL 798 - Master's Research Project Credits: 1-3
- or 3-6 credits of  BIOL 799 - Thesis Credits: 1-6

7-14 credits of electives to be chosen from the following:
• BIOL 564 - Techniques in Virology Credits: 2  
• BIOL 553 - Advanced Topics in Immunology Credits: 3  
• BIOL 682 - Advanced Eukaryotic Cell Biology Credits: 3  
• BIOS 743 - Genomics, Proteomics, and Bioinformatics Credits: 3  
• BIOS 710 - Current Topics in Bioscience Credits: 1-3  
• or relevant graduate level course work selected in consultation with the advisor

Total: 30 credits

▲ Concentration in Molecular Biology (MOB)

1–3 credits of research methodology:

• BIOL 690 - Introduction to Graduate Studies in Biology Credits: 1-2  
  or  
• BIOS 702 - Research Methods Credits: 3

13 credits of core biology:

• BIOL 568 - Advanced Topics in Molecular Genetics Credits: 3  
• BIOL 583 - General Biochemistry Credits: 4  
• BIOL 682 - Advanced Eukaryotic Cell Biology Credits: 3  

• BIOL 579 - Molecular Evolution and Conservation Genetics Credits: 3  
  or  
• BIOS 767 - Molecular Evolution Credits: 3

3 credits of bioinformatics:

• BIOL 580 - Computer Applications for the Life Sciences Credits: 3  
  or  
• BINF 630 - Bioinformatics Methods Credits: 3  
  or  
• BINF 634 - Bioinformatics Programming Credits: 3

2–4 credits of molecular techniques:
• 2–4 credits of courses satisfying the Molecular Techniques requirement

2 credits of seminar:

• BIOL 695 - Seminar in Molecular, Microbial, and Cellular Biology Credits: 1

1–6 credits of research:

• either 1-3 credits of BIOL 798 - Master's Research Project Credits: 1-3
• or 3-6 credits of BIOL 799 - Thesis Credits: 1-6

0-8 credits of electives:

• 0-8 credits of electives in BIOL, BIOS, or related areas as approved by the student’s advisor and the program director

Total: 30 credits

▲ Concentration in Systematics and Evolutionary Biology (SEB)

1–3 credits of research methodology:

• BIOL 690 - Introduction to Graduate Studies in Biology Credits: 1-2
  or
• BIOS 702 - Research Methods Credits: 3

12 credits of core biology:

• BIOL 574 - Population Genetics Credits: 4
  and
• BIOL 579 - Molecular Evolution and Conservation Genetics Credits: 3
  or
• BIOS 767 - Molecular Evolution Credits: 3
  plus 6 credits of organismal biology

2–4 credits of molecular techniques:
• 2–4 credits of courses satisfying the Molecular Techniques requirement

2 credits of seminar:

• BIOL 692 - Seminar in Biology Credits: 1
  or
• BIOL 695 - Seminar in Molecular, Microbial, and Cellular Biology Credits: 1

1–6 credits of research:

• either 1-3 credits of BIOL 798 - Master's Research Project Credits: 1-3
• or 3-6 credits of BIOL 799 - Thesis Credits: 1-6

3–12 credits of electives:

• 3–12 credits of electives in BIOL, BIOS, or related areas as approved by the student’s advisor and the program director

Total: 30 credits

Recommended Electives

The following list, for students in the molecular biology concentration or the bioinformatics and computational biology concentration, is provided as a suggestion only and is not intended to be complete. Note that two courses covering substantially similar topics may not both be counted in the student’s course plan. Students should consult their faculty research advisor or the graduate program coordinator when preparing a course plan.

• BIOL 553 - Advanced Topics in Immunology Credits: 3
• BIOL 568 - Advanced Topics in Molecular Genetics Credits: 3
• BIOL 575 - Selected Topics in Genetics Credits: 1-4
• BIOL 579 - Molecular Evolution and Conservation Genetics Credits: 3
• BIOL 583 - General Biochemistry Credits: 4
• BIOL 585 - Eukaryotic Cell Biology Laboratory Credits: 1-2
• BIOL 682 - Advanced Eukaryotic Cell Biology Credits: 3
• BIOL 793 - Research in Biology Credits: 1-3
• BIOS 740 - Laboratory Methods in Functional Genomics and Biotechnology Credits: 3
• BIOS 741 - Genomics Credits: 3
• BIOS 742 - Biotechnology Credits: 3
• BIOS 743 - Genomics, Proteomics, and Bioinformatics Credits: 3
• BIOS 744 - Molecular Genetics Credits: 3
• BIOS 767 - Molecular Evolution Credits: 3
Master's Level Certificate

Bioinformatics and Computational Biology Graduate Certificate

Banner Code:  SC-CERG-BCB

This graduate certificate program addresses the growing national and regional demand for trained computational biologists by combining a solid foundation in biotechnology with computational skills relevant to bioinformatics. With many of the courses offered in a Distance-Learning format, the flexibility of the certificate structure permits students to custom design their curriculum under an advisor’s guidance, making the certificate in bioinformatics especially relevant for students employed in today’s diverse Northern Virginia high-technology workplace. Ideal candidates for this certificate are those who have a background in biological and computer sciences, and are currently working in or planning to enter the fields of biotechnology or bioinformatics. The certificate is also highly relevant for students who are interested in advancing their career goals but may not have adequate time available to undertake a graduate degree program.

The graduate certificate in Bioinformatics and Computational Biology may be pursued on a part-time or full-time basis.

This program of study is offered by the School of Systems Biology in the College of Science.

Admission Requirements

Applicants should hold a BA or BS degree in a discipline related to biological or computer science from an accredited university, with a minimum GPA of 3.00. Applicants should have taken courses in molecular biology, computer science, calculus, physical chemistry, or statistics, and should also possess working knowledge of a computer programming language. To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, and a current résumé to the COS Graduate Admissions Processing Center. TOEFL scores are required of all international applicants.

The certificate program is a professional certification program that charges students at a differential (premium) tuition rate, with an additional $100 per credit added to the standard Mason graduate tuition rate for students who enroll in this certificate program, regardless of in-state or out-of-state status. The differential tuition is used to fund continuing improvements in the COS educational facilities used to support the certificate program. Students may not pursue this certificate concurrently with any other graduate degree program or certificate program offered by COS. In addition, students may not apply previous credit hours to the certificate program from another certificate, degree, or non degree program because of the differential (premium) tuition rate.

Program Requirements

The certificate in bioinformatics and computational biology requires a total of 15 credits, based on the set of core courses supporting the MS and PhD degree programs in bioinformatics and computational biology, along with a set of elective courses. Students are required to take three core courses, plus two courses selected from the list of electives indicated below.

Certificate Requirements

Required Core Courses (9 credits):
Elective Courses (6 credits):

Choose two of the following or other courses approved by the coordinator.

- BINF 633 - Molecular Biotechnology Credits: 3
- BINF 636 - Microarray Methodology and Analysis Credits: 3
- BINF 639 - Introduction to Biometrics Credits: 3
- BINF 730 - Biological Sequence and Genome Analysis Credits: 3
- BINF 731 - Protein Structure Analysis Credits: 3
- BINF 732 - Genomics Credits: 3
- BINF 733 - Gene Expression Analysis Credits: 3
- BINF 734 - Advanced Bioinformatics Programming Credits: 3
- BINF 739 - Topics in Bioinformatics Credits: 3

Total: 15 credits

Doctoral Degree

Bioinformatics and Computational Biology, PhD

Banner Code: SC-PHD-BCB

The main objective of the doctoral program in Bioinformatics and Computational Biology is to educate the next generation of computational biologists for careers in academia, industry, and government. The program provides students with interdisciplinary academic training that includes fundamental bioscience courses as well as core and advanced courses in bioinformatics. In general, course requirements may be completed within the first two years. The program is structured to be accessible for full- and part-time students.

This program of study is offered by the School of Systems Biology in the College of Science.

Admission Requirements

Applicants should have a bachelor’s degree in biology, computer science, or a related field, with a minimum GPA of 3.25. Admission also requires minimum GRE scores of 1,100 (verbal plus quantitative) and 4.00 (analytical writing). Applicants should have taken courses in molecular biology, cell biology, biochemistry, genetics, calculus, physical chemistry, computer programming and data structures, and probability and statistics. Students with deficiencies in one or more of these areas may be admitted provisionally and required to take additional courses, some of which may not be applicable to the 48-credit course total for the bioinformatics PhD. Students whose undergraduate record does not include basic biochemistry will be required to take a basic course prior to BINF 701 Biochemical Systematics (Biochemistry).
To apply, prospective students should forward a completed Mason graduate application, two copies of official transcripts from each college and graduate institution attended, a current résumé, and an expanded goals statement to the COS Graduate Admissions Processing Center. Applicants should also include three letters of recommendation and an official report of scores obtained on the GRE-GEN. The GRE-SUB is recommended if it is given in the student’s undergraduate major. The GRE requirement for admission to the doctoral program will be waived if the student holds a master’s degree from a U.S. institution. TOEFL scores are required of all international applicants.

**Reduction of Credit**

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

**Degree Requirements**

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

The program requires 72 credits beyond the baccalaureate degree, with a minimum of 48 credits in course work and from 12 to 24 credits of dissertation. For those holding master’s degrees, the 72 required credits may be reduced by up to 30 credits depending on the graduate courses completed. The curriculum includes 6 credits of fundamental biosciences courses, 13 credits of core bioinformatics courses, 3 credits of lab rotation, 3 credits of colloquium, 23-35 credits of electives or independent research, and 12-24 credits of combined dissertation proposal and research (BINF 998 and 999).

**Doctoral Course Work (48-60 credits)**

**Fundamental Bioscience Courses (6 credits)**

- BINF 701 - Biochemical Systematics (Biochemistry) Core for Doctoral Studies in Biosciences and Bioinformatics Credits: 3
- BINF 702 - Research Methods Credits: 3

**Core Bioinformatics Courses (13 credits)**

- BINF 690 - Numerical Methods for Bioinformatics Credits: 3
- BINF 705 - Research Ethics Credits: 1
- BINF 730 - Biological Sequence and Genome Analysis Credits: 3
- BINF 731 - Protein Structure Analysis Credits: 3
- BINF 740 - Introduction to Biophysics Credits: 3

**General Electives (23-35 credits)**
23-35 credits of approved general electives or independent research.

**Lab Rotation (3 credits)**

- BINF 703 - Bioinformatics Lab Rotation Credits: 1 (taken three times)

**Colloquium (3 credits)**

- BINF 704 - Colloquium in Bioinformatics Credits: 1 (taken three times)

**Doctoral Committee and Advancement to Candidacy**

By the end of the semester when course work is completed, the student must form a doctoral committee which will supervise the candidacy exam. The exam includes written and oral components. Upon passing the candidacy exam and submitting an acceptable dissertation proposal, the student is advanced to doctoral candidacy.

**Dissertation Research (12-24 credits)**

A minimum of 12 and maximum of 24 combined credits from BINF 998 and BINF 999 may be applied toward satisfying doctoral degree requirements. Students must take at least 3 credits of BINF 999.

- BINF 998 - Doctoral Dissertation Proposal Credits: 1-12
- BINF 999 - Doctoral Dissertation Credits: 1-12

**Doctoral Dissertation**

After advancing to doctoral candidacy, students work on their doctoral dissertation while enrolled in BINF 999. The dissertation should represent a significant contribution that is suitable for publication in a refereed scientific journal. The dissertation must be defended in a public forum before the dissertation committee and other interested faculty.

**Total: 72 credits**

**Biosciences, PhD**

**Banner Code: SC-PHD-BIOS**

The biosciences doctoral program is a research-oriented field of study that prepares students for significant contributions in academic or industrial settings. The concentration in cell and molecular biology includes microarray analysis of gene expression, sequencing and analysis of genes, gene family evolution, mechanisms of toxicology and mutagenesis, biotechnological applications, and developmental neuroscience. The concentration in microbiology and infectious disease stresses molecular
mechanisms of infectious disease, genomic and proteomic analysis of pathogens, and the physiology and metabolism of pathogens.

The academic component is a three-tiered structure. The first tier provides a set of four core courses designed to advance research skills across all disciplines. The second tier comprises four or five core courses and elective courses. The first two tiers are designed to be completed in approximately two years, including the comprehensive qualifying exam. Only on completion of these requirements, the qualifying exam, and a successful dissertation proposal can the students advance to candidacy status. The third tier focuses on research and culminates in a dissertation.

This program of study is offered by the School of Systems Biology in the College of Science.

Admission Requirements

In addition to materials required of all applicants for graduate study, the following is also required:

- Minimum 3.25 GPA in previous course work with significant training in the biological sciences. A TOEFL score of 575 on the paper-based exam or 230 on the computer-based exam is required of international students.
- Three letters of recommendation from faculty members or individuals who have firsthand knowledge of the applicant’s academic or professional capabilities.
- Statement of purpose consistent with the research interests of at least one faculty member in the program.
- Scores on GRE general exam (required) and biology or biochemistry subject exam (recommended) taken within the past five years prior to date of application submission.

An interview may also be required. Applications should be submitted by February 1 for fall admission. Under unusual circumstances, applications may be considered for spring admission if they are received by October 1. Applications will be considered until positions are filled. Students are encouraged to meet application deadlines to be considered for scholarships and stipends. Strong candidates who lack several prerequisites may be admitted to provisional status. Removal from provisional status and continuation in the program is contingent on earning a GPA of 3.25 in the program’s fundamental courses, plus completion of missing prerequisites.

Students who have not taken a course in basic biochemistry will be required to complete one prior to BIOS 701.

Reduction of Credit

For students entering the doctoral program with a master's degree in a related field from a regionally accredited institution, the number of required credits may be reduced up to 30 credits, subject to approval of the program faculty and the associate dean for student and academic affairs. See the College of Science graduate policies section for more information.

Degree Requirements

Students must satisfy all requirements for doctoral degrees expressed in the Academic Policies section of this catalog.

Candidates for the PhD in biosciences must complete a minimum of 72 graduate credits. For students entering the doctoral program with a master’s of science degree, the number of credits required may be reduced by a maximum of 30 with approval of the advisor and the program director. Graduate credits taken previously and not used toward another degree may be transferred, subject to the approval of the advisor, the program director, and the dean.

Students in the doctoral program are required to present two research papers at a meeting or conference any time before graduation.

Doctoral Course Work (48-60 credits)
Bioscience Core (12 credits):

- BIOL 682 - Advanced Eukaryotic Cell Biology Credits: 3
- BIOS 703 - Laboratory Rotation Credits: 3 (taken twice for a total of 6 credits)
- BIOS 704 - Topics in Biosciences Credits: 1 (taken for a total of 3 credits)

Concentration (12 credits):

▲ Concentration in Cell and Molecular Biology (CMB)

This concentration prepares students for significant contributions in an academic or industrial research career. Coursework covers microarray analysis of gene expression, proteome analysis, sequencing and analysis of gene polymorphisms, gene and genome evolution, molecular studies of disease mechanisms, mechanisms of toxicology and mutagenesis, and biotechnological applications.

Students take 12 credits of coursework chosen from the following:

- BIOS 740 - Laboratory Methods in Functional Genomics and Biotechnology Credits: 3
- BIOS 741 - Genomics Credits: 3
- BIOS 742 - Biotechnology Credits: 3
- BIOS 743 - Genomics, Proteomics, and Bioinformatics Credits: 3
- BIOS 744 - Molecular Genetics Credits: 3

Total: 12 credits

▲ Concentration in Microbiology and Infectious Disease (MID)

Students in this concentration will be prepared for employment in academia, government, or industry. By stressing mechanisms of pathogenicity, physiology, metabolism, and genomics of pathogens, students will have a firm foundation for future research in infectious disease. Students will also be introduced to advanced laboratory practices, such as animal research methodologies and biocontainment laboratory work.

Students take 12 credits of coursework chosen from the following:

- BIOL 553 - Advanced Topics in Immunology Credits: 3
- BIOL 563 - Virology Credits: 3
- BIOL 669 - Pathogenic Microbiology Credits: 3
- BIOL 715 - Microbial Physiology Credits: 3
- BIOL 718 - Techniques in Microbial Pathogenesis Credits: 3
Total: 12 credits

Elective Courses (24-36 credits):

24-36 credits chosen from the following to complete 72 credits:

- BIOL 564 - Techniques in Virology Credits: 2
- BIOL 568 - Advanced Topics in Molecular Genetics Credits: 3
- BIOL 579 - Molecular Evolution and Conservation Genetics Credits: 3
- BIOL 580 - Computer Applications for the Life Sciences Credits: 3
- BIOL 685 - Emerging Infectious Diseases Credits: 3
- BIOS 701 - Biochemical Systematics Credits: 3
- BIOS 702 - Research Methods Credits: 3
- BIOS 710 - Current Topics in Bioscience Credits: 1-3
- BIOS 740 - Laboratory Methods in Functional Genomics and Biotechnology Credits: 3
- BIOS 741 - Genomics Credits: 3
- BIOS 742 - Biotechnology Credits: 3
- BIOS 743 - Genomics, Proteomics, and Bioinformatics Credits: 3
- BIOS 744 - Molecular Genetics Credits: 3
- BIOS 760 - Seminar in Molecular Systematics Credits: 1-3
- BIOS 898 - Directed Studies in Biosciences Credits: 1-12
- BIOS 899 - Directed Research in Biosciences Credits: 1-12
- BINF 633 - Molecular Biotechnology Credits: 3
- BINF 636 - Microarray Methodology and Analysis Credits: 3
- BINF 705 - Research Ethics Credits: 1

Dissertation Committee

Upon admission to the program, each student is assigned an advisor from the bioscience faculty. The advisor may be changed by mutual consent of student and advisor, or petition to the program director and dean. With their advisor, students adopt an individual program that focuses on a specific area of research.

By the end of the fourth semester of course work, students assemble a dissertation committee of four graduate faculty members with representation from at least two academic departments. The faculty advisor and the program director approve the program of study.

Qualifying Examination

On nearing completion of course requirements, students take a qualifying exam with a written and an oral component. At the discretion of the committee, the written qualifying exam may be retaken once if the student’s performance was deemed below satisfaction.

Advancement to Candidacy
Upon successful completion of the qualifying exam, the majority of all course work, and an accepted thesis proposal, students will be recommended for advancement to candidacy by the committee and the program director.

The semester after advancement to candidacy, students are eligible to enroll in dissertation research (BIOS 999). Students must review their progress on the dissertation with their graduate committee on a regular basis until graduation.

**Dissertation Research (12–24 credits):**

Note: no more than 24 combined credits from BIOS 998 and BIOS 999 may be applied toward satisfying doctoral degree requirements. Students register for a minimum of 3 credits of BIOS 999 in the first semester of advancement.

- BIOS 998 - Doctoral Dissertation Proposal Credits: 1-6
- BIOS 999 - Doctoral Dissertation Research Credits: 1-12

**Doctoral Dissertation**

After advancing to doctoral candidacy, students work with their dissertation committee to develop their dissertation proposal into a completed doctoral dissertation. The dissertation research should represent a significant contribution that is publishable in a refereed scientific journal. When the dissertation is complete, students will present their results to their graduate committee and defend their dissertation in a public forum.

**Total: 72 credits**
The College of Visual and Performing Arts (CVPA) creates an academic environment in which the arts are considered as individual disciplines as well as interdisciplinary forms that strengthen each other. Courses of study are designed to lead to careers as creators, performers, teachers, managers, and scholars of the arts, as well as prepare students for the challenges of a rapidly changing world. In addition to providing strong programs for arts majors and minors, CVPA strives to ensure that Mason’s entire student population has the opportunity to experience and study the arts as a key component of a well-rounded liberal arts education.

Studying the arts goes hand in hand with creation and performance. CVPA provides the theaters, studios, rehearsal spaces, computer laboratories, recital halls, and performance classrooms in which students hone their skills. Each major features strong academic preparation in the history and theory of the art form that supports discipline-based technique courses. Creative work and performance are at the core of most courses of study. The college’s faculty of practicing artist-teachers works closely with students in a variety of curricular and co-curricular creative projects. Once basic techniques are established, students are encouraged to stretch, grow, and experiment within this supportive environment. Students regularly perform, create, exhibit, and otherwise develop their art forms in a wide variety of public venues, enhancing their experience as working artists while enriching the cultural life of the campus community.

An education in the arts is deepened by regular contact with the work of distinguished visiting artists. The college is home to the Center for the Arts on the Fairfax campus and the Hylton Performing Arts Center on the Prince William campus, both of which
include a variety of professional presenting and producing units that provide a diverse program of cultural experiences for the entire university community, as well as Northern Virginia and the greater Washington, D.C., area. Artists from across the country and around the world regularly perform in the Concert Hall and the Hylton Center, give master classes, work with students during extended residencies, and interact with the community in a variety of other ways. The accessibility and vitality of the Concert Hall, Hylton Center, TheaterSpace, the Art and Design Building and Johnson Center Galleries, Harris Theater, and other campus venues make the arts pervasive at Mason and in our larger community.

Administration

William F. Reeder, Dean
Linda G. Miller, Senior Associate Dean
Brian Marcus, Associate Dean, Development and Alumni Affairs
Victoria N. Salmon, Associate Dean, Graduate Studies
Scott Martin, Assistant Dean, Research, Technology
Andrew Bursten, Director Finance and Administration, CFO
Thomas Reynolds, Director of Artistic Programming, Marketing and Audience Services
Julie Thompson, Executive Director, Center for the Arts
Rick Davis, Executive Director, Hylton Performing Arts Center

Undergraduate Degree Programs

The undergraduate degree consists of course work in university general education, a major area of study, and electives. To earn a bachelor’s degree, students must complete a minimum of 120 credits, of which at least 45 must be upper level courses (numbered 300 and above). At least one course at the 300 or 400 level must be designated “writing intensive.”

Graduate Degree Programs

CVPA’s graduate programs offer highly focused study designed to prepare students for professional work in the arts and education. The requirements for each graduate degree are described in the sections that follow.

Academic Policies

The requirements for each academic program offered by the college are described in the sections below. Students are ultimately responsible for their academic progress towards their degrees. All students are subject to the university's general academic policies in addition to those specific to each academic unit. Please see the Academic Policies section of this catalog.

Questions about Academic Policies

Students with questions regarding exceptions to academic policies should contact the CVPA Academic Affairs Office (College Hall, C200; 703-993-4551).

Academic Course Load

Undergraduate students earning degrees in CVPA may register for 18 credits per fall and spring semester without the dean’s permission. Students are advised that they will be required to pay additional tuition beyond the 16-credit, university full-time academic load. Graduate students earning degrees in CVPA may register for a maximum of 13 credits per fall and spring semester. Students should be cognizant of the time commitment when they register for their courses, especially if they register for high numbers of credits. Students are urged to consult with their advisor and familiarize themselves with Mason guidelines for work and academic load. Students are reminded that employment must not take priority over course work.

Accommodations for Disabled Students
Students with documented disabilities should contact the Office of Disability Services (Student Union I, Room 222; 703-993-2474) to open a file and learn more about accommodations that may be available to them.

**Advising**

Students are assigned advisors and are strongly encouraged to meet with them periodically, and particularly when they achieve 75 credits or are two semesters before expected graduation. Undeclared CVPA students and undergraduate students in academic difficulty (cumulative GPA under 2.00) are required to see an advisor prior to registration for the semester following registration restriction.

**Minimum Cumulative GPA in Major**

Undergraduate students earning CVPA degrees must earn a minimum 2.00 cumulative GPA in their major, or higher, if required by their program.

**E-mail**

George Mason uses only Mason e-mail accounts to communicate with enrolled students. Students should activate their Mason e-mail, use it to communicate with their school/department/program and other administrative units, and check it regularly for important information.

**Foreign Language Requirement**

Some degrees within CVPA require intermediate-level proficiency in one foreign language. This requirement may be fulfilled by completing a course in a foreign language numbered 202, 209, or 210 (or higher level courses taught in the language) or achieving a satisfactory score on an approved proficiency test. International students should consult the CVPA Student Academic Affairs Office about a possible waiver of this requirement.

**General Education Program**

The baccalaureate degree requires students to take a range of courses that provide a broad knowledge of the world, develop the ability to think both conceptually and critically, acquaint them with many different methods of inquiry, and provide the skills to continue intellectual growth throughout their lives. Students select from a range of courses outlined in the University General Education chapter (University General Education). Students accepted into the Honors Program in General Education fulfill some/all of their core general education requirements with completion of that program of study. Students are strongly advised to consult the University General Education chapter of this catalog for information concerning general education.

**Minors**

University policy states that students must earn 8 distinct credits that are not used for their major toward their minor. Some departments have more specific criteria for applying credits to a minor.

**Physical Education Courses**

Activity courses offered by the Health, Fitness, and Recreation Resources Department cannot be counted toward credits required for a degree in CVPA. Students may take non-activity PHED courses for elective credit for CVPA degrees.

**Prerequisites**

Undergraduate students must earn a C or better and graduate students must earn a B- or better in prerequisite courses to proceed to the next course.

**Registration**

Students are personally responsible for correctly registering for courses and paying all tuition and fees by the official university registration and payment deadlines. Instructors do not have the authority to add students to courses. All students should verify the accuracy of their enrollment before the end of the add and drop periods.
Study Elsewhere

Students enrolled at George Mason University are expected to complete their coursework in residence. Exceptions to this policy are rare and are considered only under extraordinary circumstances and on a case-by-case basis. Students must obtain advance, written approval from their department/program and dean's office before enrolling in classes elsewhere. Students who do not obtain advance, written approval must apply for re-admission to the university.

To be considered for an exception to this policy, students must have completed the immediately preceding semester with a GPA of 2.00 or higher and not be in danger of academic probation, suspension or dismissal. Freshmen and new transfer students are not allowed to take courses elsewhere as they have yet to establish an academic record at George Mason. Since transfer students have already transferred a number of hours, they are expected to plan all remaining courses in residence. Local community colleges are not part of the University Consortium, and requests to take community college courses are seldom approved. Courses offered at Consortium Universities must be reviewed by the Consortium Coordinator in advance and will not be considered for general study elsewhere review.

Courses elsewhere that have been pre-approved by the dean's office must be taken for a grade and be passed with a GPA of 2.00 or higher in order to be transferred to George Mason. Although credit for the course can be transferred, the grade for the course cannot.

Students must make arrangements with the visited institution to have an official transcript mailed directly to the George Mason Office of the University Registrar immediately after the course work is completed. Credit cannot be transferred until an official transcript is received.

Transfer of Credit

Undergraduate students may transfer a maximum of 18 credits earned in nondegree status into a degree program.

Graduate credit earned prior to admission to a certificate, master’s, or doctoral program may be eligible to be transferred and applied to a CVPA graduate program, certificate or doctoral degree. Please see the Graduate Policies/Transfer of Credit portion of the catalog for more detailed information about the requirements.

Withdrawals

Students are responsible for all courses in which they remain officially enrolled once the drop period has ended.

Instructors do not have the authority to withdraw students from classes. Withdrawals require the approval of the academic dean and are typically allowed only for full semesters at a time (all enrolled courses) and are only permitted for non-academic reasons. No withdrawals can be approved to avoid an unsatisfactory grade. When submitting a withdrawal request, students must provide verifiable, third-party documentation for the reason for the withdrawal. Requests for withdrawals should be submitted as early in the semester as possible, and never after the last day of classes.

Undergraduates enrolled in degree programs are eligible to withdraw from three classes through the ninth week (of a fifteen week semester) without dean's approval and at the student's own discretion during their entire undergraduate career at Mason. See University Academic Policies for further details.

Appeals Process

Appeals of Academic Procedures:

See Academic Policies in George Mason University's University Catalog.

CVPA Procedures for Grade Appeal:

Although faculty members are generally the best judges of student performance in their classes, circumstances may cause a student to believe that a professor is unfair. Grade appeals are not accepted after the last day of classes for the following
semester, as indicated in the Schedule of Classes (spring for fall grades, fall for spring and summer grades). The following are the College's steps in grade appeals:

1. The student meets with the professor to discuss the grade and class performance; this meeting should occur within two weeks of the student's written request for a meeting; if the instructor is no longer affiliated with the University, the appeal is made to the Department or Program Chair.
2. The professor (Chair) responds to the student within three days of the meeting.
3. If the student were to continue the appeal, the student must submit a written appeal to Academic Affairs Office. The Dean for Academic Affairs reviews all undergraduate appeals, and the Dean for Graduate Programs reviews all graduate appeals.

The decision of the CVPA Senior Associate Dean is final.

**CVPA Procedures for Appeal of an Academic Action:**

In exceptional circumstances a student may request a meeting to review the decision of an academic action.

1. The student must state in writing the reasons for requesting further appeal of an academic action, and provide any additional or new information relevant to the appeal.
2. The Dean for Academic Affairs reviews all undergraduate appeals, and the Dean for Graduate Programs reviews all graduate appeals.
3. The dean will conduct a review of the documentation provided by the student, and may request additional information in order to make an informed decision.
4. A nonparticipating observer of the student's choice may attend the meeting with the dean, and the dean may also have a nonparticipating observer attend.
5. The student may follow University appeal procedures outlined in the University Catalog.

**CVPA Procedure for Non-Academic Appeals or Grievance:**

A student who intends to file a non-academic appeal, or intends to file a grievance against a faculty member, another student, or administrator follows the following steps:

1. The student meets with the professor and Department Chair to discuss the non-academic appeal/grievance; this meeting should occur within two weeks of the student's written request for a meeting; if the person is no longer affiliated with the University, the request is made to the Department or Program Chair only.
2. The professor (Chair) responds to the student within three days of the meeting.
3. If the student were to continue the non-academic appeal/grievance, the student must submit a written explanation to Academic Affairs Office. The Dean for Academic Affairs reviews all non-academic appeals and grievances.

**Academic Dismissal from a Graduate Program:**

The Office of the University Registrar contacts students via e-mail if they earned an academic warning, or dismissal. Students wishing to appeal should contact the CVPA Graduate Programs Office within three days of the e-mail date. A deadline for the appeal documentation is determined, normally two weeks. Students are to submit:

1. a written statement explaining the circumstances that led to the dismissal, along with supporting documentation from employers, physicians, or other sources as necessary;
2. evidence that the circumstances precipitating the unsatisfactory academic performance have been remedied;
3. statement from department and program's graduate coordinator supporting the student's continued enrollment at the University.

Upon receipt of the above,

1. The Dean for Graduate Programs reviews the appeal.
2. The final decision of the Dean is forwarded to the student and the Office of the University Registrar.
3. The student may follow University appeal procedures outlined in the University Catalog.

For these, and any other academic concerns, students are encouraged to contact George Mason University's Ombudsman for Student Academic Affairs. The ombudsman is a neutral, independent, informal, and confidential party who provides assistance to students in resolving university-related concerns. The ombudsman is an advocate for fairness and the equitable treatment of students, operates independently of all formal grievance processes at the university, and considers all sides of an issue in an
impartial and objective manner. The ombudsman has no authority to make exceptions or to grant requests but can perform informal investigations and, as a result, may recommend actions that lead to changes in processes and policies at the university. Meetings with the ombudsman are confidential. The ombudsman serves all undergraduate and graduate students at the university. (Academic Policies)

CVPA Courses

Some CVPA courses transcend individual disciplines. These courses are administered by the Dean’s Office and are designated CVPA in the Courses chapter of this catalog.

■ School of Art

Art and Design Building, Room 2050
Phone: 703-993-8898
Web: soa.gmu.edu

Faculty

Harold Linton, Director

Professors: Carbonneau, Frederick, Kravitz (gallery director), Linton (director), Sandell

Associate Professors: Ashcraft, Cooley, Crawford, Endress, Feerick, Frenn, Rothstein, Whit, Wrbican

Assistant Professors: Cui, Karametou, Sheridan, Winant (associate director)

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Adjunct Faculty: Bradley, Carr, Cusner, Dicicco, Erlich-Moss, Feuer, Goldman, Gorman, Guerrieri, Hicks, Ho, Hoffmann, Morris, Nahidian, Organ, Petzwinkler, Porrata, Salyards, Sapsford, Tomhave, Watson

Mission

The School of Art offers students an environment in which the pursuit of a degree is a commitment to a way of life that centers on creative thought processes and the production of artworks. The curriculum and the faculty focus on cultivating students’ appreciation of and expertise in studio and digital arts. Students are encouraged to dedicate themselves to academic excellence, skilled artistry, and employing visual literacy within an atmosphere of creative freedom. The faculty’s ongoing engagement with artistic practice forms a vital part of the student-instructor relationship. By offering instruction in traditional and contemporary technologies for art making, faculty members help students develop a strong foundation to realize their personal and professional goals.

A principle that underlies the School of Art Program is its focus on fostering student understanding and experience of the interdisciplinary nature of inquiry and practice in the visual arts. This focus is important because art today crosses the boundaries of traditional disciplines and integrates traditional and technology-based media into the creation of new art forms. This interdisciplinary focus is introduced to all AVT majors in required Foundations and Core courses and is reinforced throughout the AVT curriculum.

Course Work

The School of Art offers all course work designated AVT in the Courses chapter of this catalog.
Undergraduate Programs

Undergraduate studio degrees offered by the School of Art include the bachelor of arts (BA) and the bachelor of fine arts (BFA). The school also offers an undergraduate minor, an interdisciplinary minor in multimedia, and an honors program for selected AVT majors.

Neither the BA nor the BFA program satisfies all requirements for those seeking accreditation for teaching in the public schools. Undergraduate students interested in this field should contact the school’s art education advisor to learn more about teacher preparation.

All George Mason University students are welcome to enroll in course work in the School of Art. Consult the course listings for prerequisites.

Admission to School of Art Requirements

All students are admitted to School of Art programs of study separately from their admission to the University by portfolio review. All students who have applied to the University who intend to be candidates for either the BA or BFA in Art and Visual Technology must complete a portfolio review before they are accepted in the School of Art Program.

- All transfer students who intend to become candidates for a BA or BFA in Art and Visual Technology must complete a portfolio review as a part of their general application to the University.
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For all candidates, admission to the BA and BFA programs are competitive and require the following:

- Portfolio of 10 to 15 original examples of current or college level work
- One-page, double-spaced essay that describes the candidate's interest in a studio art degree
- 3.00 cumulative GPA overall

In addition, for all transfer students the following are required:

- Transcripts of all college-level study
- Portfolio review (face-to-face reviews are preferred but work may be submitted by CD in some cases)

Artsbus Requirement

All AVT majors must meet the school’s requirement of travel to galleries and museums through the Artsbus program. Students meet this requirement by enrolling in AVT 300 Artsbus Attendance. The procedure and requirements for enrollment in AVT 300 are the same as for any other class.

Freshmen who enroll as AVT majors must accumulate five AVT 300 credits during their course of study. Transfer students and students who change their majors to AVT must take AVT 300 for the equivalent of each semester they are enrolled at Mason, up to a maximum of five semesters. Semesters of enrollment in AVT 300 do not have to be consecutive. Students may take AVT
300 up to three times in a semester if they wish to accelerate their completion of the requirement although this is strongly discouraged.

All rules and requirements to AVT 300/Artsbus participation are posted on the Artsbus web site: http://artsbus.gmu.edu. Students are responsible for being familiar with and following the posted rules and requirements for Artsbus. The site also provides pertinent information for each trip regarding exhibits as well as reviews and articles for exhibitions.

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Mason requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. AVT students fulfill this requirement by successfully completing AVT 395 (or AVT 494 for BFA students planning to pursue the MAT in art education).

**Upper-Level Credits**

All undergraduate students are required to complete a minimum of 45 credits of upper-division courses at the 300–499 level.

**Major GPA**

All School of Art undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

To graduate with a BA or BFA in Art and Visual Technology with a concentration in Graphic Design, students are required to maintain a 2.40 grade point average in concentration classes. Students who fail to maintain this minimum may either retake core classes (an earned higher grade replaces the old one) or take concentration special topics classes in order to raise their average to the threshold. The effect of this change will be that very weak students will have to return to required classes to master core skills, and marginally weak students will be able to meet the requirement while expanding the breadth of their education.

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The School of Art program is located in the Art and Design Building which houses well-equipped studios for drawing, painting, photography, printmaking, and sculpture, as well as six computer-equipped studios that cross platforms and are installed with current software applications used for two-dimensional imaging, three-dimensional modeling, animation, video production, sound editing, multimedia authoring, photography, and web publishing.

Policies, procedures, and schedules for studio use are established by the AVT studio faculty and are posted in the studios.

**School of Art Honors Program**
Students interested in the Honors Program in School of Art should contact the director of the school. Both BA and BFA students are eligible to apply for admission to the program. Honors students must complete at least 4 credits of AVT 394 Honors Seminar. They must have a cumulative GPA of at least 3.00 and at least 3.50 in AVT 394 and the AVT major.

**Graduate Programs**

The MA in Graphic Design offers students a comprehensive study and preparation for the graphic design profession. The program calls for 36 credits, which includes courses in typography, web design, image making, and brand design. The broad range of study is intended to develop professionals prepared for an ever-expanding graphic design field. This degree is the only MA in Graphic Design in the Capital region.

The Art Education Licensure Certificate is a post-baccalaureate program designed for those who currently hold a graduate degree in an art-related field along with those who want a more immediate entrance into the art teaching profession. This "licensure only" program, which results in a pre K-12 art certification in the Commonwealth of Virginia, is a 21 credit program consisting of graduate education courses, area endorsements, student teaching internships and seminar. There is a MAT Graduate Degree option with an additional 9 graduate credits.

The Master of Arts in Teaching in Art Education is a preservice degree program that prepares students with a BFA degree or equivalent for pre K-12 art licensure by the Commonwealth of Virginia. Using a studio-based approach to art education and working closely with area public school systems, the MAT degree consists of 30 credits of graduate art education, school practicum experience, studio work, and preservice teaching internship and seminar.

The MFA is a terminal degree that prepares students to become professional artists, work in technology or arts-related fields, and teach at the university level. Candidates are required to complete 60 credits, of which 45 credits are made up from both core and studio requirements. An additional 15 credits are based on comprehensive experience.

MFA students may choose an emphasis in digital arts, graphic design, painting, photography, printmaking, sculpture, or InterArts. The latter offers students the opportunity to combine art forms in interdisciplinary projects that may be installation, performance, publishing, time-based, or writing-based; and combine creative and critical approaches to their work.

While it is anticipated that students will move through the MFA as described in this catalog, individuals with extensive professional accomplishment may, upon recommendation of the SOA Graduate Committee and with prior approval of the CVPA dean, craft an individualized program that meets curricular requirements.

**Academic Policies**

Please see College of Visual and Performing Arts academic policies.

**Undergraduate Degree**

**Art and Visual Technology, BA**

**Banner Code: AR-BA-AVT**

Art and Design Building, Room 2050  
Phone: 703-993-8898  
Web: soa.gmu.edu/

**Faculty**
Harold Linton, Director

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- 3.00 cumulative GPA overall

In addition, for all transfer students the following are required:

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- Portfolio review (face-to-face reviews are preferred but work may be submitted by CD in some cases)

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All SOA undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

To graduate with a concentration in graphic design, students are required to maintain a 2.40 grade point average in concentration classes. Students who fail to maintain this minimum may either retake core classes (an earned higher grade replaces the old one) or take concentration special topics classes in order to raise their average to the threshold. The effect of this change will be that very weak students will have to return to required classes to master core skills, and marginally weak students will be able to meet the requirements while expanding the breadth of their education.

Studies

The School of Art program is located in the Art and Design Building which houses well-equipped studios for drawing, painting, photography, printmaking, and sculpture, as well as six computer-equipped studios that cross platforms and are installed with current software applications used for two dimensional imaging, three-dimensional modeling, animation, video production, sound editing, multimedia authoring, photography, and web publishing.

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School of Art Honors Program

Students interested in the Honors Program in School of Art should contact the director of the school. Both BA and BFA students are eligible to apply for admission to the program. Honors students must complete at least 4 credits of AVT 394 Honors Seminar. They must have a cumulative GPA of at least 3.00 and at least 3.50 in AVT 394 and the AVT major.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

Degree Requirements

General Education (37 credits)

Foundation Requirements

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
  (Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101.
  Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.)
- Oral communication Credits: 3
- Quantitative reasoning Credits: 3
- Information technology Credits: 3

Core Requirements

- Literature Credits: 3
- Arts Credits: 3*
- Natural science (including at least one laboratory science) Credits: 7
- Western civilization Credits: 3
- Global understanding Credits: 3**
- Social and behavioral sciences Credits: 3

Notes:

*AVT majors may not choose AVT courses to meet this requirement, and they may not double-count ARTH courses toward both
the AVT major and the university general education arts requirement.

**AVT majors may not double-count ARTH courses toward both AVT major requirements and the university general education
global understanding requirement.

AVT Major Requirements (60-63 credits)

Studio Foundation (17 credits)

- AVT 101 - New Majors Colloquium Credits: 1
- AVT 104 - Studio Fundamentals I Credits: 4
- AVT 105 - Studio Fundamentals II Credits: 4
- AVT 222 - Drawing I Credits: 4
- AVT 323 - Drawing II Credits: 4 or AVT 324 - Figure Drawing Credits: 4

Art History, Critical Analysis, Contemporary Practice (18 credits)

- ARTH 200 - Survey of Western Art Credits: 3 or ARTH 203 - Survey of Asian Art Credits: 3 or ARTH 204 - Survey of
  Latin American Art Credits: 3
- ARTH 201 - Survey of Western Art Credits: 3
- ARTH 374 - Art Now Credits: 3
- AVT 301 - Visual Voices Colloquium Credits: 1 (must be taken for a total of 3 credits or each semester, if less than 3
  semesters)
- AVT 307 - Aesthetics Credits: 3
- AVT 395 - Writing for Artists Credits: 3
Breadth and Experience (9-12 credits)

Choose three of the following classes; at least one course must be a 200-level studio course:

- AVT 215 - Typography Credits: 4
- AVT 217 - Introduction to Web Design Credits: 4
- AVT 232 - Painting I Credits: 4
- AVT 243 - Printmaking I Credits: 4
- AVT 252 - Fundamentals of Photography Credits: 4
- AVT 253 - Introduction to Digital Photography Credits: 4
- AVT 262 - Sculpture I Credits: 4
- AVT 272 - Interdisciplinary Arts Credits: 4
- AVT 280 - Introduction to New Media Arts Credits: 4
- AVT 326 - Nontraditional Approaches to Drawing Credits: 4
- AVT 346 - Digital Printmaking Credits: 4
- AVT 374 - Sound Art I Credits: 4
- AVT 385 - EcoArt Credits: 4
- AVT 496 - Special Topics: (specific course title varies) Credits: 1-4
- Or other courses as approved by program director

Synthesis (4 credits)

- AVT 497 - Senior Project Credits: 4 or AVT 498 - Senior Design Project Credits: 4

Concentration (12 credits)

12 credits in one of the following areas: Drawing, Graphic Design, InterArts, New Media, Painting, Photography, Printmaking or Sculpture

▲ Drawing (DRW)

- AVT 422 - Drawing III Credits: 4
- AVT 423 - Drawing IV Credits: 4

4 credits from:

- AVT 324 - Figure Drawing Credits: 4
- AVT 326 - Nontraditional Approaches to Drawing Credits: 4
- AVT 333 - Painting II Credits: 4
- AVT 336 - Experimental Painting Credits: 4
- AVT 337 - Figurative Painting Credits: 4
- AVT 432 - Painting III Credits: 4
- AVT 433 - Painting IV Credits: 4
Note:

All AVT majors concentrating in drawing must complete AVT 232 (Painting I) under Breadth and Experience.

▲ Graphic Design (GD)

- AVT 311 - Graphic Design Methods and Principles Credits: 4
- AVT 313 - Editorial Design Credits: 4
- AVT 414 - Corporate Design and Branding Credits: 4

Graphic Design Note

All AVT majors concentrating in graphic design must complete AVT 252 Photography I or AVT 253 Introduction to Digital Photography under Breadth and Experience.

▲ InterArts (IA)

- AVT 373 - Performance Studio Credits: 4
- AVT 473 - Advanced Performance Studio Credits: 4

4 credits from:

- AVT 372 - Hip Hop Culture Credits: 3
- AVT 374 - Sound Art I Credits: 4
- AVT 376 - Live Movies Credits: 4
- AVT 378 - The African American Experience in the Performing Arts Credits: 3
- AVT 491 - Independent Study in Art and Visual Technology Credits: 1-6

▲ New Media Art (NMA)

12 credits from:

- AVT 382 - 2D Experimental Animation Credits: 4
- AVT 383 - 3D Experimental Animation Credits: 4
- AVT 390 - Video Art Credits: 4
- AVT 482 - Advanced Image Making Credits: 4
- AVT 483 - Art and Interactivity Credits: 4
- AVT 487 - Advanced Topics: New Media Art Credits: 4

▲ Painting (PNT)

- AVT 333 - Painting II Credits: 4
- AVT 432 - Painting III Credits: 4
- AVT 433 - Painting IV Credits: 4
▲ Photography (PHO)

- AVT 353 - Traditional Photo Methods Credits: 4
- AVT 359 - About Photography: Practice and Research Credits: 3
- 1 credit of AVT 496 - Special Topics: (specific course title varies) Credits: 1-4

4 credits from:

- AVT 452 - Advanced Traditional Photo Methods Credits: 4
- AVT 453 - Professional Photo Practices Credits: 3
- AVT 454 - Alternative Photo Processes Credits: 4
- AVT 455 - Digital Printing Techniques Credits: 4
- AVT 456 - Large Format Photography Credits: 4
- AVT 457 - Documentary Photography Credits: 4
- AVT 458 - Advanced Studio Lighting Credits: 4
- 1 credit of AVT 496 - Special Topics: (specific course title varies) Credits: 1-4

Photography Note:

All AVT majors concentrating in photography must complete AVT 252 Photography I under Breadth and Experience.

▲ Printmaking (PM)

- AVT 343 - Printmaking II Credits: 4

8 credits from:

- AVT 345 - Paper/Print/Book as Language Credits: 4
- AVT 346 - Digital Printmaking Credits: 4
- AVT 442 - Printmaking III Credits: 4
- AVT 443 - Printmaking IV Credits: 4

▲ Sculpture (SCL)

- AVT 363 - Sculpture II Credits: 4
- AVT 462 - Sculpture III Credits: 4
- AVT 463 - Sculpture IV Credits: 4

Concentration Electives
AVT 496 - Special Topics: (specific course title varies) or AVT 491 - Independent Study in Art and Visual Technology may be taken with permission of respective Division Coordinator.

General Electives (20-23 credits)

BA students must use general electives to either complete a minor, double major or double degree outside their primary major field of study (15–20 credits) or demonstrate intermediate-level proficiency in one foreign language (0–12 credits)*. After fulfilling one of these options, the remaining general electives may be taken inside or outside of the department. All students are required to take a minimum of 45 credits of upper-division courses (300 and 400 level); most students will require at least 13 elective credits at the 300 level or above.

AVT 393 Field Experience in the Arts and AVT 489 Internship are not required courses but are highly recommended as electives for BA students.

*See beginning of CVPA chapter for foreign language requirement.

Total: 120 credits

Art and Visual Technology, BFA

Banner Code: AR-BFA-AVT

Art and Design Building, Room 2050
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Course Work

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Undergraduate Program

This intensive, 120-credit studio production program emphasizes analytical, creative, and experiential aspects of studio and new media art. It is designed to prepare students professionally as visual artists or for graduate study in the fine arts. Students devote a significant portion of their college careers to an in-depth study in one of the following concentrations: drawing, graphic design, interdisciplinary arts (InterArts), new media art, painting, photography, printmaking, or sculpture.

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Artsbus Requirement

All AVT majors must meet the school’s requirement of travel to galleries and museums through the Artsbus program. Students meet this requirement by enrolling in AVT 300 Artsbus Attendance. The procedure and requirements for enrollment in AVT 300 are the same as for any other class.

Freshmen who enroll as AVT majors must accumulate five AVT 300 credits during their course of study. Transfer students and students who change their majors to AVT must take AVT 300 for the equivalent of each semester they are enrolled at Mason, up to a maximum of five semesters. Semesters of enrollment in AVT 300 do not have to be consecutive. Students may take AVT 300 up to three times in a semester if they wish to accelerate their completion of the requirement, although this is strongly discouraged.

All rules and requirements of AVT 300/Artsbus participation are posted on the Artsbus web site: http://artsbus.gmu.edu. Students are responsible for being familiar with and following the posted rules and requirements for Artsbus. The site also provides pertinent information for each trip regarding exhibits as well as reviews and articles for exhibitions.

Visual Voices Requirement

All AVT majors must fulfill three credits of Visual Voices, AVT 301, in order to graduate, unless they are enrolled at Mason for fewer than three semesters. If enrolled for less than three semesters, students are required to have one AVT 301 credit per semester in which they are enrolled. Visual Voices is an intrinsic part of the major, offering students a chance to meet with and hear nationally and internationally recognized artists speak about their work. The procedure and requirements for enrollment in AVT 301 are the same as for any other class.

Writing-Intensive Requirement

Mason requires all students to complete at least one course designated as “writing intensive” in their majors at the 300 level or above. AVT students fulfill this requirement by successfully completing AVT 395 (or AVT 494 for BFA students planning to pursue the MAT in art education).

Upper-Level Credits

All undergraduate students are required to complete a minimum of 45 credits of upper-division courses at the 300–499 level.

Major GPA

All SOA undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

To graduate with a concentration in Graphic Design, students are required to maintain a 2.40 grade point average in concentration classes. Students who fail to maintain this minimum may either retake core classes (an earned higher grades replaces the old one) or take concentration special topics classes in order to raise their average to the threshold. The effect of this change will be that very weak students will have to return to required classes to master core skills, and marginally weak students will be able to meet the requirement while expanding the breadth of their education.

Studios

The School of Art program is located in the Art and Design Building which houses well-equipped studios for drawing, painting, photography, printmaking, and sculpture, as well as six computer-equipped studios that cross platforms and are installed with
current software applications used for two dimensional imaging, three-dimensional modeling, animation, video production, sound editing, multimedia authoring, photography, and web publishing.

Policies, procedures, and schedules for studio use are established by the AVT studio faculty and are posted in the studios.

**School of Art Honors Program**

Students interested in the Honors Program in School of Art should contact the director of the school. Both BA and BFA students are eligible to apply for admission to the program. Honors students must complete at least 4 credits of AVT 394 Honors Seminar. They must have a cumulative GPA of at least 3.00 and at least 3.50 in AVT 394 and the AVT major.

**Academic Policies**

Please see College of Visual and Performing Arts academic policies.

**MAT Degree in Art Education**

Students intending to pursue the MAT degree in Art Education after their undergraduate studies have slightly different degree requirements for the BFA. See below for full course listings.

**Degree Requirements**

**General Education (37 credits)**

**Foundation Requirements**

- Oral communication Credits: 3
- Quantitative reasoning Credits: 3
- Information technology Credits: 3
- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.

**Core Requirements**

- Literature Credits: 3
- Arts Credits: 3*
- Natural science (including at least one laboratory science) Credits: 7
- Western civilization Credits: 3
- Global understanding Credits: 3**
- Social and behavioral sciences Credits: 3

**Notes:**
AVT majors may not choose AVT courses to meet this requirement, and they may not double-count ARTH courses toward both the AVT major and the university general education arts requirement.

**AVT majors may not double-count ARTH courses toward both AVT major requirements and the university general education global understanding requirement.

AVT Major Requirements (78-81 credits)

Studio Foundation (17 credits)

- AVT 101 - New Majors Colloquium Credits: 1
- AVT 104 - Studio Fundamentals I Credits: 4
- AVT 105 - Studio Fundamentals II Credits: 4
- AVT 222 - Drawing I Credits: 4
- AVT 323 - Drawing II Credits: 4 or AVT 324 - Figure Drawing Credits: 4

Art History, Critical Analysis, Contemporary Practice (24 credits)

- ARTH 201 - Survey of Western Art Credits: 3
- ARTH 374 - Art Now Credits: 3
- 3* credits of AVT 301 - Visual Voices Colloquium Credits: 1
- AVT 307 - Aesthetics Credits: 3
- AVT 395 - Writing for Artists Credits: 3
- AVT 472 - Critical Theory in the Visual Arts Credits: 3
  Choose one of the following**:  
- ARTH 200 - Survey of Western Art Credits: 3
- ARTH 203 - Survey of Asian Art Credits: 3
- ARTH 204 - Survey of Latin American Art Credits: 3
  Choose one of the following*:  
- AVT 305 - Creative Processes Credits: 3
- AVT 309 - Art as Social Action Credits: 3
- AVT 371 - Visual Perception and the Arts Credits: 3
- AVT 372 - Hip Hop Culture Credits: 3
- AVT 374 - Sound Art I Credits: 4
- AVT 418 - History of Graphic Design Credits: 3
- AVT 493 - Teaching Visual Thinking Through Media, PK-12 Credits: 3
- 3 credits of 300-400 level ARTH

*Transfer students with less than three semesters remaining must take AVT 301 for each remaining semester.  
**Students concentrating in graphic design must take AVT 418 to meet this requirement.

Breadth and Experience (9-12 credits)

Any three of the following (see each concentration for individual requirements):

- AVT 215 - Typography Credits: 4
- AVT 217 - Introduction to Web Design Credits: 4
- AVT 232 - Painting I Credits: 4
- AVT 243 - Printmaking I Credits: 4
- AVT 252 - Fundamentals of Photography Credits: 4
- AVT 253 - Introduction to Digital Photography Credits: 4
- AVT 262 - Sculpture I Credits: 4
- AVT 272 - Interdisciplinary Arts Credits: 4
- AVT 280 - Introduction to New Media Arts Credits: 4
- AVT 326 - Nontraditional Approaches to Drawing Credits: 4
- AVT 346 - Digital Printmaking Credits: 4
- AVT 374 - Sound Art I Credits: 4
- AVT 385 - EcoArt Credits: 4
- AVT 496 - Special Topics: (specific course title varies) Credits: 1-4
- Or other courses as approved by program director

**Synthesis (4 credits)**

- AVT 497 - Senior Project Credits: 4 or AVT 498 - Senior Design Project Credits: 4

**Concentration (24 credits)**

Choose one of the following areas: Drawing, Graphic Design, InterArts, New Media Art, Painting, Photography, Printmaking, or Sculpture.

▲ **Drawing (DRW)**

- AVT 422 - Drawing III Credits: 4
- AVT 423 - Drawing IV Credits: 4
- 12 credits of 300-400 level AVT
  AND

  Choose one of the following:
  - AVT 324 - Figure Drawing Credits: 4
  - AVT 326 - Nontraditional Approaches to Drawing Credits: 4
  - AVT 333 - Painting II Credits: 4
  - AVT 336 - Experimental Painting Credits: 4
  - AVT 337 - Figurative Painting Credits: 4
  - AVT 432 - Painting III Credits: 4
  - AVT 433 - Painting IV Credits: 4

**Note:**

All AVT majors concentrating in drawing must complete AVT 232 (Painting I) under Breadth and Experience.

▲ **Graphic Design (GD)**
• AVT 311 - Graphic Design Methods and Principles Credits: 4
• AVT 313 - Editorial Design Credits: 4
• AVT 414 - Corporate Design and Branding Credits: 4
  12 credits chosen from:
  • AVT 411 - Motion Design Credits: 4
  • AVT 412 - Advanced Typography Credits: 4
  • AVT 413 - Professional Design Practices Credits: 4
  • AVT 415 - Web Design and Usability Credits: 4
  • AVT 416 - Advertising Design Credits: 4
  • AVT 417 - Package Design Credits: 4
  • AVT 419 - Topics in Graphic Design Credits: 1-6
  • AVT 420 - Advanced Web Design Credits: 4

Graphic Design Notes:

AVT 491 - Independent Study in Art and Visual Technology or AVT 496 - Special Topics: (specific course title varies) may be taken with permission of the Area Coordinator.

All AVT majors concentrating in graphic design must complete AVT 217 - Introduction to Web Design and AVT 252 - Fundamentals of Photography or AVT 253 - Introduction to Digital Photography under Breadth and Experience.

▲ InterArts (IA)

• AVT 373 - Performance Studio Credits: 4
• AVT 473 - Advanced Performance Studio Credits: 4
• 4 credits of 300-400 level AVT
  AND

  12 credits chosen from the following:
  • AVT 372 - Hip Hop Culture Credits: 3
  • AVT 374 - Sound Art I Credits: 4
  • AVT 376 - Live Movies Credits: 4
  • AVT 378 - The African American Experience in the Performing Arts Credits: 3
  • AVT 491 - Independent Study in Art and Visual Technology Credits: 1-6

▲ New Media Art (NMA)

• 12 credits of 300-400 level AVT
  AND

  12 credits chosen from the following:
  • AVT 374 - Sound Art I Credits: 4
  • AVT 382 - 2D Experimental Animation Credits: 4
  • AVT 383 - 3D Experimental Animation Credits: 4
  • AVT 385 - EcoArt Credits: 4
  • AVT 390 - Video Art Credits: 4
• AVT 482 - Advanced Image Making Credits: 4
• AVT 483 - Art and Interactivity Credits: 4
• AVT 487 - Advanced Topics: New Media Art Credits: 4

▲ Painting (PNT)

• AVT 333 - Painting II Credits: 4
• AVT 432 - Painting III Credits: 4
• AVT 433 - Painting IV Credits: 4
• 4 credits of 300-400 level AVT
AND

8 credits chosen from the following:
• AVT 336 - Experimental Painting Credits: 4
• AVT 337 - Figurative Painting Credits: 4
• AVT 434 - Painting V Credits: 4
• AVT 435 - Painting VI Credits: 4

▲ Photography (PHO)

• AVT 353 - Traditional Photo Methods Credits: 4
• AVT 359 - About Photography: Practice and Research Credits: 3
• 1 credit of AVT 496 - Special Topics: (specific course title varies) Credits: 1-4
• 8 credits of 300-400 level AVT
AND

8 credits chosen from the following:
• AVT 452 - Advanced Traditional Photo Methods Credits: 4
• AVT 453 - Professional Photo Practices Credits: 3
• AVT 454 - Alternative Photo Processes Credits: 4
• AVT 455 - Digital Printing Techniques Credits: 4
• AVT 456 - Large Format Photography Credits: 4
• AVT 457 - Documentary Photography Credits: 4
• AVT 458 - Advanced Studio Lighting Credits: 4
• 1 credit of AVT 496 - Special Topics: (specific course title varies) Credits: 1-4

Photography Note:

All AVT majors concentrating in photography must complete AVT 252 Photography I under Breadth and Experience.

▲ Printmaking (PM)
• AVT 343 - Printmaking II Credits: 4
• 12 credits of 300-400 level AVT
  AND
• 8 credits chosen from the following:
  • AVT 345 - Paper/Print/Book as Language Credits: 4
  • AVT 346 - Digital Printmaking Credits: 4
  • AVT 442 - Printmaking III Credits: 4
  • AVT 443 - Printmaking IV Credits: 4

▲ Sculpture (SCL)

• AVT 363 - Sculpture II Credits: 4
• AVT 462 - Sculpture III Credits: 4
• AVT 463 - Sculpture IV Credits: 4
• 12 credits of 300-400 level AVT

General Electives (2-5 credits)

Total: 120 credits

Degree Requirements for Students Intending to Pursue the MAT Degree in Art Education

General Education (38 credits)

Foundation Requirements

• Oral Communication Credits: 3
• Quantitative reasoning Credits: 3
• Information technology Credits: 4 (AVT 180 - New Media in the Creative Arts and CS 105 - Computer Ethics and Society or PHIL 112 - Ethics and the Cybersociety)
• ENGH 101 - Composition Credits: 3
• ENGH 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.

Core Requirements
• Literature Credits: 3
• Natural Science (including at least one laboratory science) Credits: 7
• Western Civilization Credits: 3
• Arts Credits: 3 (ARTH 200 - Survey of Western Art)
• Global Understanding Credits: 3 (ARTH 203 - Survey of Asian Art recommended)
• Social and Behavioral Sciences Credits: 3 (PSYC 100 - Basic Concepts in Psychology recommended)
• Synthesis options are specified and counted under AVT major requirements

AVT Major Requirements (78-80 credits)

Studio Foundation (17 credits)

• AVT 101 - New Majors Colloquium Credits: 1
• AVT 104 - Studio Fundamentals I Credits: 4
• AVT 105 - Studio Fundamentals II Credits: 4
• AVT 222 - Drawing I Credits: 4
• AVT 323 - Drawing II Credits: 4 or AVT 324 - Figure Drawing Credits: 4

Art History, Critical Analysis, Contemporary Practice (24 credits)

Credits for ARTH 200 may be counted toward the major and the arts university general education requirement only for students who complete all five of the required undergraduate art education courses (AVT 493, 494, 495, EDUC 301, 302).

• ARTH 200 - Survey of Western Art Credits: 3
• ARTH 201 - Survey of Western Art Credits: 3
• ARTH 374 - Art Now Credits: 3
• 3* credits of AVT 301 - Visual Voices Colloquium Credits: 1
• AVT 307 - Aesthetics Credits: 3
• AVT 472 - Critical Theory in the Visual Arts Credits: 3
• AVT 493 - Teaching Visual Thinking Through Media, PK-12 Credits: 3
• AVT 494 - Teaching Critical Response to Art, PK-12 Credits: 3 (meets the writing-intensive requirement)
  *Transfer students with less than three semesters remaining must take AVT 301 for each remaining semester.

Breadth and Experience (9-11 credits)

• AVT 262 - Sculpture I Credits: 4 or another three dimensional-focused course
• AVT 495 - Introduction to Art Teaching and Learning Credits: 3
  AND

Choose 4 credits from the following:
• AVT 215 - Typography Credits: 4
• AVT 217 - Introduction to Web Design Credits: 4
• AVT 232 - Painting I Credits: 4
• AVT 243 - Printmaking I Credits: 4
• AVT 252 - Fundamentals of Photography Credits: 4
• AVT 253 - Introduction to Digital Photography Credits: 4
• AVT 272 - Interdisciplinary Arts Credits: 4
• AVT 280 - Introduction to New Media Arts Credits: 4
• AVT 326 - Nontraditional Approaches to Drawing Credits: 4
• AVT 346 - Digital Printmaking Credits: 4
• AVT 374 - Sound Art I Credits: 4
• AVT 385 - EcoArt Credits: 4
• AVT 496 - Special Topics: (specific course title varies) Credits: 1-4
• Or other courses as approved by program director

Synthesis (4 credits)

• AVT 497 - Senior Project Credits: 4 or AVT 498 - Senior Design Project Credits: 4

Concentration (24 credits)

Choose one of the following areas: Drawing, Graphic Design, InterArts, New Media Art, Painting, Photography, Printmaking, or Sculpture.

▲Drawing (DRW)

• AVT 422 - Drawing III Credits: 4
• AVT 423 - Drawing IV Credits: 4
• 12 credits of 300-400 level AVT
  AND
  Choose one of the following:
• AVT 324 - Figure Drawing Credits: 4
• AVT 326 - Nontraditional Approaches to Drawing Credits: 4
• AVT 333 - Painting II Credits: 4
• AVT 336 - Experimental Painting Credits: 4
• AVT 337 - Figurative Painting Credits: 4
• AVT 432 - Painting III Credits: 4
• AVT 433 - Painting IV Credits: 4

Note:

All AVT majors concentrating in drawing must complete AVT 232 Painting I under Breadth and Experience.
Graphic Design (GD)

- AVT 311 - Graphic Design Methods and Principles Credits: 4
- AVT 313 - Editorial Design Credits: 4
- AVT 414 - Corporate Design and Branding Credits: 4

AND

Choose 12 credits from the following:
- AVT 411 - Motion Design Credits: 4
- AVT 412 - Advanced Typography Credits: 4
- AVT 413 - Professional Design Practices Credits: 4
- AVT 415 - Web Design and Usability Credits: 4
- AVT 416 - Advertising Design Credits: 4
- AVT 417 - Package Design Credits: 4
- AVT 419 - Topics in Graphic Design Credits: 1-6
- AVT 420 - Advanced Web Design Credits: 4

Graphic Design Notes:

AVT 491 - Independent Study in Art and Visual Technology or AVT 496 - Special Topics: (specific course title varies) may be taken with permission of Area Coordinator.

All AVT majors concentrating in graphic design must complete AVT 217 - Introduction to Web Design and AVT 252 - Fundamentals of Photography or AVT 253 - Introduction to Digital Photography under Breadth and Experience.

InterArts (IA)

- AVT 373 - Performance Studio Credits: 4
- AVT 473 - Advanced Performance Studio Credits: 4
- 4 credits of 300-400 level AVT
  AND
- 12 credits chosen from the following:
  - AVT 372 - Hip Hop Culture Credits: 3
  - AVT 374 - Sound Art I Credits: 4
  - AVT 376 - Live Movies Credits: 4
  - AVT 378 - The African American Experience in the Performing Arts Credits: 3
  - AVT 491 - Independent Study in Art and Visual Technology Credits: 1-6

New Media Art (NMA)
• 12 credits of 300-400 level AVT
  AND
  12 credits chosen from the following:
• AVT 374 - Sound Art I Credits: 4
• AVT 382 - 2D Experimental Animation Credits: 4
• AVT 383 - 3D Experimental Animation Credits: 4
• AVT 385 - EcoArt Credits: 4
• AVT 390 - Video Art Credits: 4
• AVT 482 - Advanced Image Making Credits: 4
• AVT 483 - Art and Interactivity Credits: 4
• AVT 487 - Advanced Topics: New Media Art Credits: 4

▲Painting (PNT)

• AVT 333 - Painting II Credits: 4
• AVT 432 - Painting III Credits: 4
• AVT 433 - Painting IV Credits: 4
• 4 credits of 300-400 level AVT
  AND
  8 credits chosen from the following:
• AVT 336 - Experimental Painting Credits: 4
• AVT 337 - Figurative Painting Credits: 4
• AVT 434 - Painting V Credits: 4
• AVT 435 - Painting VI Credits: 4

▲Photography (PHO)

• AVT 353 - Traditional Photo Methods Credits: 4
• AVT 359 - About Photography: Practice and Research Credits: 3
• 1 credit ofAVT 496 - Special Topics: (specific course title varies) Credits: 1-4
• 8 credits of 300-400 level AVT
  AND
  8 credits chosen from the following:
• AVT 452 - Advanced Traditional Photo Methods Credits: 4
• AVT 453 - Professional Photo Practices Credits: 3
• AVT 454 - Alternative Photo Processes Credits: 4
• AVT 455 - Digital Printing Techniques Credits: 4
• AVT 456 - Large Format Photography Credits: 4
• AVT 457 - Documentary Photography Credits: 4
• AVT 458 - Advanced Studio Lighting Credits: 4
• 1 credit of AVT 496 - Special Topics: (specific course title varies) Credits: 1-4
Photography Note:

All AVT majors concentrating in photography must complete AVT 252 Photography I under Breadth and Experience.

▲Printmaking (PMT)

- AVT 343 - Printmaking II Credits: 4
- 12 credits of 300-400 level AVT
  AND
  8 credits from the following:
  - AVT 345 - Paper/Print/Book as Language Credits: 4
  - AVT 346 - Digital Printmaking Credits: 4
  - AVT 442 - Printmaking III Credits: 4
  - AVT 443 - Printmaking IV Credits: 4

▲Sculpture (SCL)

- AVT 363 - Sculpture II Credits: 4
- AVT 462 - Sculpture III Credits: 4
- AVT 463 - Sculpture IV Credits: 4
- 12 credits of 300-400 level AVT

General Electives (2-4 credits)

Total: 120 credits

Note:

Following this curriculum does not guarantee entry into the MAT Program. Prospective MAT students must meet all MAT admissions requirements as described in the catalog, including completing EDUC 301 - Educationally Diverse Populations: Handicapped, Gifted, Multicultural and EDUC 302 - Human Growth and Development to meet state education requirements.

Undergraduate Minor

Art and Visual Technology Minor
The minor in AVT requires 20 credits and offers a core of foundational studies with the opportunity for further study in the following areas: drawing, graphic design, InterArts, new media arts, painting, photography, printmaking, or sculpture.

University policy states that students must earn 8 distinct credits that are not used for their major toward their minor.

Course Work

- AVT 104 - Studio Fundamentals I Credits: 4 or AVT 105 - Studio Fundamentals II Credits: 4
- AVT 222 - Drawing I Credits: 4
- 4-8 credits selected from AVT 200-299
- 4-8 credits selected from AVT 300-499

Total: 20 credits

Graphic Design Minor

Banner Code: GD

This minor is not available to AVT majors. All Graphic Design minor students are required to take AVT 104 for their Art General Education requirement as well as AVT 180 for the Information Technology (IT, except ethics) requirement.

Course Work

- AVT 215 - Typography Credits: 4
- AVT 311 - Graphic Design Methods and Principles Credits: 4
- AVT 313 - Editorial Design Credits: 4 or AVT 414 - Corporate Design and Branding Credits: 4
- AVT 418 - History of Graphic Design Credits: 3
Total: 15 credits

Master’s Degree

Art and Visual Technology, MFA

Banner Code: AR-MFA-AVT

Art and Design Building, Room 2050
Phone: 703-993-8898
Web: soa.gmu.edu/

Faculty

Harold Linton, Director

Professors: Carbonneau, Frederick, Kravitz (gallery director), Linton (director), Sandell

Associate Professors: Ashcraft, Cooley, Crawford, Endress, Feerick, Frenn, Rothstein, White, Wrbican

Assistant Professors: Cui, Karametou, Sheridan, Winant (associate director)

Term Assistant Professors: Constantine, Del Popolo, Stanley, Starr

Adjunct Faculty: Bradley, Carr-Shaffer, Cushner, Dicicco, Erlich-Moss, Feuer, Goldman, Gorman, Guerrieri, Hicks, Ho, Hoffmann, Morris, Nahidian, Organ, Petzwinkler, Porrata, Salyards, Sapsford, Tomhave, Watson

Graduate Program

The MFA is a terminal degree that prepares students to become professional artists, work in technology or arts-related fields, and teach at the university level. Candidates are required to complete 60 credits of which 45 credits are made up from both core and studio requirements. An additional 15 credits are based on comprehensive experience.

MFA students may choose an emphasis in graphic design, new media art, painting, photography, printmaking, sculpture, or InterArts. The latter offers students the opportunity to combine art forms in interdisciplinary projects that may be installation, performance, publishing, time-based, or writing-based, and combine creative and critical approaches in their work.

While it is anticipated that students will move through the MFA as described in this catalog, individuals with extensive professional accomplishment may, upon recommendation of the SOA Graduate Committee and with prior approval of the CVPA dean, craft an individualized program that meets curricular requirements.

Admission Requirements

In addition to meeting the general university requirements for admission for graduate study, candidates for the MFA must hold a BA or BFA degree. Upon applying, they must submit a portfolio, statement of intent and professional goals, and three letters of
reference. Graphic design emphasis applicants must also submit a critical or historical essay or academic paper on a design (preferred) or art-related topic. Applications will be accepted for the fall semester only. The deadline for receipt of application materials is January 15.

Diversity among students accepted for study is another consideration. Applicants with degrees in areas other than art are welcome, although they may be required to complete undergraduate core courses.

**Portfolio Guidelines**

The applicant’s portfolio is a major selection criterion for graduate admission and should represent the applicant’s most accomplished work.

The portfolio and all other application materials should be submitted to the Office of Graduate Admissions. For more information, contact the School of Art office at 703-993-8898.

Portfolio requirements are different for each graduate area of emphasis and are listed below. Incomplete portfolios will not be considered.

Applicants’ portfolio items are considered part of the application for admission and, thus, cannot be returned. Please do not send original materials.

**Portfolio requirements by area of emphasis:**

Graphic Design: 20 samples of design work on a Mac (Apple Macintosh platform) compatible CD. Samples may include pdf’s, high-resolution tiff or jpeg files, html’s and samples of motion design. Samples must be numbered on the CD and correspond to an accompanying written descriptive list. List should include: name of artist, title and date. Videos and Flash files (no more than four minutes for each section) must be playable from a Mac-compatible CD or DVD. In the case of collaborative work, the applicant's role should be clearly stated.

New Media: 20 images on a Mac (Apple Macintosh platform) compatible CD. CD images must be numbered on the CD and correspond to an accompanying written descriptive list. List should include: name of artist, title, date, medium, and size of each work. Videos (no more than four minutes for each selection) must be playable from a Mac-compatible CD or DVD. Only the relevant parts of the video should be marked for viewing, with the applicant’s role clearly stated. New Media applicants should not submit slides.

Painting: 20 images on a Mac-compatible CD or slides. All images must be numbered and correspond to an accompanying written descriptive list. List should correspond in number and include: name of artist, title, medium, size, and date of each work.

Photography: 20 images on a Mac-compatible CD or slides. All images must be numbered and correspond to an accompanying written descriptive list. List should correspond in number and include: name of artist, title, medium, size, and date of each work.

Printmaking: 20 images on a Mac-compatible CD or slides. All images must be numbered and correspond to an accompanying written descriptive list. List should correspond in number and include: name of artist, title, medium, size, and date of each work.

Sculpture: 20 images on a Mac-compatible CD, slides or DVD. All images must be numbered and correspond to an accompanying written descriptive list. List should correspond in number and include: name of artist, title, medium, size, and date of each work.

InterArts: 20 images on a Mac-compatible CD, slides, videos, or writing-based materials. All images on the CD must be numbered and correspond to an accompanying written descriptive list. List should correspond in number and include: name of artist, title, medium, size, and date of each work. If videos are included, they must contain no more than four minutes for each selection. Only the relevant parts of the video should be marked for viewing, with the applicant’s role clearly stated. If writing-based materials are submitted, they should be submitted in printed form.
Supplementary material for all applicants, but not specifically requested by the review committee, such as CDs (Mac-compatible only), videos (DVD, VHS in NTSC format), film, web addresses, press clippings, or reviews of exhibitions may be submitted but will be reviewed only at the discretion of the AVT graduate application reviewers.

**Studios**

The School of Art is located in the Art and Design Building which houses well-equipped studios for drawing, painting, photography, printmaking, and sculpture, as well as six computer-equipped studios that cross platforms and are installed with current software applications used for two dimensional imaging, three-dimensional modeling, animation, video production, sound editing, multimedia authoring, photography, and web publishing.

Policies, procedures, and schedules for studio use are established by the AVT studio faculty and are posted in the studios.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Degree Requirements**

**Core Requirements for all Areas of Emphasis except Graphic Design (33 credits)**

- 8 credits of AVT 500+ Art and Visual Technology Course Work
- AVT 599 - Special Topics in Art and Visual Technology Credits: 1-6 (Must be taken for a total of 4 credits)
- AVT 600 - Research Methodologies Credits: 3
- AVT 610 - Graduate Seminar Credits: 2 (Must be taken for a total of 8 credits)
- AVT 620 - Theory, Criticism, and the Visual Arts Credits: 3
- AVT 621 - Art Writing Seminar Credits: 3
- AVT 670 - Teaching Practicum Credits: 2 (Must be taken for a total of 4 credits)

**Core Requirements for Graphic Design Area of Emphasis (30 credits)**

- AVT 500+ Graphic Design Course Work Credits: 8-16
- AVT 500+ Art and Visual Technology Course Work Credits: 0-8
- AVT 611 - Graduate Design Seminar Credits: 1 (Must be taken for a total of 5 credits)
- AVT 613 - Graphic Design History Credits: 3
- AVT 617 - Advanced Typography Credits: 4
- AVT 618 - Visual Communication Theories Credits: 2
- AVT 670 - Teaching Practicum Credits: 2 (0-4 credits)

**Studio Emphases (16 credits)**

MFA students must complete 16 credits in graphic design, InterArts, new media art, painting, photography, printmaking, or sculpture, as follows:
Graphic Design Emphasis

- AVT 641 - Graduate Graphic Design I Credits: 4
- AVT 646 - Graduate Graphic Design II Credits: 4
- AVT 647 - Advanced Graduate Graphic Design I Credits: 4
- AVT 648 - Advanced Graphic Design II Credits: 4

InterArts Emphasis

Any four graduate studio courses as approved by the division director of InterArts, for a total of 16 credits. InterArts graduate students may combine courses from the studio areas of emphasis and work with faculty to design an interdisciplinary thesis project.

New Media Art Emphasis

Any four of the following courses:

- AVT 616 - Advanced Art and Interactivity Credits: 5
- AVT 676 - Graduate Sound Art Credits: 4
- AVT 682 - Experimental 2D Animation Credits: 4
- AVT 684 - Advanced Image Making Credits: 4
- AVT 685 - Video Art Credits: 4
- AVT 686 - Experimental 3D Animation Credits: 4
- AVT 687 - Advanced Topics: New Media Credits: 4
- AVT 688 - Hybrid Animation Credits: 4

Painting Emphasis

- AVT 632 - Graduate Painting I Credits: 4
- AVT 633 - Graduate Painting II Credits: 4
- AVT 634 - Advanced Graduate Painting I Credits: 4
- AVT 635 - Advanced Graduate Painting II Credits: 4

Photography Emphasis

- AVT 652 - Graduate Photography I Credits: 4
- AVT 653 - Graduate Photography II Credits: 4
- AVT 654 - Advanced Graduate Photography I Credits: 4
- AVT 655 - Advanced Graduate Photography II Credits: 4
Printmaking Emphasis

- AVT 642 - Graduate Printmaking I Credits: 4
- AVT 643 - Graduate Printmaking II Credits: 4
- AVT 644 - Advanced Graduate Printmaking I Credits: 4
- AVT 645 - Advanced Graduate Printmaking II Credits: 4

Sculpture Emphasis

- AVT 662 - Graduate Sculpture I Credits: 4
- AVT 663 - Graduate Sculpture II Credits: 4
- AVT 664 - Advanced Graduate Sculpture I Credits: 4
- AVT 665 - Advanced Graduate Sculpture II Credits: 4

MFA Comprehensive Experience (11-14 credits)

Candidates must complete all of the above core and studio requirements as well as the following:

- AVT 796 - Directed Reading Credits: 1 (Graphic Design emphasis must be taken for 2 credits)
- AVT 798 - Directed Project and Exhibition Credits: 1-7 (Graphic Design area of emphasis must take for a total of 9 credits and all other areas of emphasis must take for a total of 7 credits)
- AVT 799 - Thesis Credits: 1-3 (Must be taken for a total of 3 credits)

Note:

The comprehensive experience involves a study of the historical basis for a studio project; an independent creative production suitable for public viewing; and a written thesis documenting the evolution of the creative problem and exploring the intention, purpose, and relative success of the finished project.

Total: 60 credits

Art Education, MAT

Banner Code: AR-MAT-ARTE

Phone: 703-993-8562

Web: arteducation.gmu.edu
Graduate Program

The School of Art offers a Master of Arts in Teaching in Art Education for BFA students and a concentration for licensed art teachers.

The Master of Arts in Teaching in Art Education is a preservice degree program that prepares students with a BFA degree or equivalent for PreK-12 art licensure by the Commonwealth of Virginia. Using a studio-based approach to art education and working closely with area public school systems, the MAT degree consists of 30 credits of graduate art education, school practice experience, studio work, and preservice teaching internship and seminar.

The concentration for licensed art teachers is designed for PreK-12 licensed art teachers who currently hold an undergraduate degree in art education and are interested in obtaining a graduate art education degree for further professional development. Students take graduate art education courses, approved AVT 500 level graduate studio art courses, education courses, and a capstone project.

Admission Requirements

In addition to meeting the general university admission requirements for graduate study, admission to this program is contingent on completion of a BFA in art or approved equivalent. Also, candidates must have a minimum 3.00 cumulative undergraduate GPA. Eligibility for the MAT in Art Education Program may demand additional course work to establish proficiency in visual arts. Students lacking a strong background in the visual arts or pedagogy will be required to satisfy prerequisite courses prior to the required graduate courses.

Students interested in pursuing the degree with the concentration for licensed art teachers must meet the above with the following exceptions: admission is contingent upon the completion of a BFA or BA in art or art education with a minimum 3.00 cumulative undergraduate GPA, maintaining a current PreK-12 license to teach art education with at least one or more years of art teaching experience and official passing scores on Praxis I (or SAT equivalent) and Praxis II. (Exceptions to the Praxis scores will be determined on a case-by-case basis.)

Applications will be accepted for fall and spring semesters. The deadline for receipt of application materials is October 1 and March 1. Each applicant must provide the following materials:

- Completed application form
- Certified copies of all undergraduate transcripts and any graduate transcripts
- Statement of intent and professional goals for entering the field
- Three letters of reference from faculty members or individuals who have firsthand knowledge of the applicant’s academic or professional capabilities
- Official score on Praxis I or SAT equivalent (and Praxis II for those who apply to pursue the concentration for licensed art teachers)
- TOEFL score, if required by Mason policies
- Portfolio Requirement*:
  - MAT (for BFA students) portfolio must include 15 to 20 images that reflect artistic breadth and depth, including drawing skills of the applicant’s art.
  - MAT with concentration for licensed art teachers portfolio must include 10 images of the applicant’s personal art that reflect artistic breadth and depth, including drawing skills, along with 10 student art works displaying a variety of 2-D and 3-D media. Student artwork is to be accompanied by a brief description of the lesson content.

*These works must be presented in Power Point format on a Mac-compatible CD. All portfolios must include a written image sheet with the corresponding number, title, date, medium, and size of each work. Incomplete portfolios will not be considered. Applicants’ CD portfolios are considered part of the application for admission and, thus, cannot be returned. Please do not send original materials.
The portfolio and all other application materials should be submitted to the Office of Graduate Admissions. Qualified applicants will be invited to an on-campus interview. Portfolio review of original art works, and in-person writing sample are required for MAT (BFA student) applicants.

Diversity among students is another consideration for acceptance into the program. Applicants with degrees in areas other than art are welcome, although they may be required to complete undergraduate core, studio, and art history courses.

MAT matriculates who earned a BFA at an institution other than Mason may be required to take additional undergraduate credits as post baccalaureate core requirements before acceptance into the program. Without equivalent courses, they will be required to take two BFA foundational courses in art education and education: AVT 493 and 494.

In addition, applicants who did not take equivalent undergraduate courses must also take AVT 180 Computers in the Creative Arts, plus any additional studio or art history course work to meet Virginia licensure requirements.

**Academic Policies**

Please see College of Visual and Performing Arts academic policies.

**Degree Requirements**

**Required Core Courses**

- AVT 605 - Issues and Research in Art Education Credits: 3
- AVT 667 - Two-Dimensional Art Making: Form, Theme, and Context Credits: 3
- AVT 668 - Three-Dimensional Art Making across Cultures Credits: 3

**MAT (for BFA students) Required Courses**

Course work meets licensure and Master's degree requirements. The listing below follows the recommended sequencing for licensure.

- AVT 595 - Introduction to Art Teaching and Learning Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3
- EDRD 501 - Literacy and Curriculum Integration, PK-12 Credits: 3
- AVT 691 - Elementary Art Education Credits: 3
- AVT 692 - Secondary Art Education Credits: 3
  *Prior to Internship, must pass: Praxis II, VCLA, technology & child abuse standards*
- AVT 695 - Internship in Art Education (Student Teaching) Credits: 5
- AVT 696 - Internship for Student Teachers Credits: 1

**Professional Teaching Portfolio**
The comprehensive experience for the MAT (for BFA students) includes the following: (1) a group exhibition, “The Art of Teaching Art Showcase,” in which MAT candidates display and formally present works of PreK–12 student art completed during the internship, along with exemplars of the MAT candidate’s own artwork, and (2) a culminating review of the intern’s competencies as reflected in a professional teaching portfolio, accomplished during the internship seminar course that accompanies student teaching. All process folios, lesson plans, explanations of projects, visual images, and other relevant materials must be made available for the project committee to review. Artworks and all materials should be exhibited in a manner that reveals the student’s aesthetic accomplishments. This exhibition and review will assess the MAT candidate’s final professional teaching portfolio that may be used at interviews for employment. These requirements will be accomplished during the internship seminar course that accompanies student teaching. A committee of MAT faculty will determine whether the student has mastered the field of study. Students who are unable to successfully complete the full student teaching internship in art education and seminar for student teachers will be terminated from the MAT in Art Education Program.

Teacher Endorsement

Students for the MAT (for BFA students) must complete ALL endorsements, including Praxis I, PLUS art education foundational courses AVT 493 Teaching Visual Thinking Through Media PK-12 and AVT 494 Teaching Critical Respond to Art, PK-12, totaling 6 credit hours. (NOTE: these courses may be taken concurrently with other MAT courses.) Students must have a studio major in the Visual Arts and meet Virginia Department of Education's required semester credit hours in the following specific areas: 12 hours of two-dimensional media, 12 hours of three-dimensional media, 9 hours of cultural context and art history, judgment and criticism, aesthetics, and 3 hours of related areas of the fine arts.

Notes:

MAT (for BFA students) will receive ongoing evaluation reviews by the MAT faculty to determine whether they have achieved satisfactory progress toward their degree.

▲Licensed Art Teachers Concentration (LAT) Required Courses

- AVT 500+ Approved Graduate AVT Studio Credits: 4
- AVT 599 - Special Topics in Art and Visual Technology Credits: 1-6 Prints/Paper/Books as Language Credits: 4
- AVT 606 - Creativity and Cognition in the Arts and Media Credits: 3
- AVT 615 - Technology for Art Teachers Credits: 3
- 1 credit of AVT 698 - Ind Study/Directed Readings Credits: 1-3
- EDUC 500+ Approved graduate Education classes Credits: 3
- EDUC 537 - Foundations of Multicultural Education Credits: 3

Notes:

MAT for Licensed Art Teachers Concentration students must complete a Capstone Project. Under the guidance of a faculty advisor, students will select a topic in a personal area of interest in art education pedagogy, carry out in-depth research, and prepare a capstone final project in the form of a written report and visual presentation.

Total: 30 credits
Notes:

All MAT students must pass Praxis II and Virginia Communication and Language Assessment (VCLA) to receive placement for student teaching in the final semester.

Graphic Design, MA

Banner Code: AR-MA-GD

Art and Design Building, Room 2050
Phone: 703-993-8898
Web: soa.gmu.edu/

Faculty

Harold Linton, Director

Professors: Carbonneau, Frederick, Kravitz (gallery director), Linton (director), Sandell

Associate Professors: Ashcraft, Cooley, Crawford, Endress, Feerick, Frenn, Rothstein, White, Wrbican

Assistant Professors: Cui, Karametou, Sheridan, Winant (associate director)

Term Assistant Professors: Constantine, Del Popolo, Stanley, Starr

Adjunct Faculty: Bradley, Carr-Shaffer, Cushner, Dicicco, Erlich-Moss, Feuer, Goldman, Gorman, Guerrieri, Hicks, Ho, Hoffmann, Morris, Nahidian, Organ, Petzwinkler, Porrata, Salyards, Sapsford, Tomhave, Watson

Graduate Program

The MA in Graphic Design offers students a comprehensive study and preparation for the graphic design profession. The program calls for 36 credits, which includes courses in typography, web design, image making, and brand design. The broad range of study is intended to develop professionals prepared for an ever-expanding graphic design field.

Admission Requirements

Application deadlines are as published by the University. Applicants should have an earned BA or BFA degree in Graphic Design from an accredited college or university, with a GPA of 3.00 in art courses. However, applicants with a BA or BS in another discipline, and work experience in the field may apply for admission also. Student should schedule an interview with design faculty prior to admission.

In addition to meeting the general university requirements for admission for graduate study, applicants must submit three letters of recommendation from faculty members, or those who can evaluate the applicant's academic potential; a sample of academic writing about art or graphic design, such as a paper from an art or design history course; and a CD or DVD with 20 examples of design works in PDF, jpeg, or a format that will play in a standard web browser.

Portfolio Guidelines
The applicant’s portfolio is a major selection criterion for graduate admission and should represent the applicant’s most accomplished work.

Applicants’ portfolio items are considered part of the application for admission and, thus, cannot be returned. Please do not send original materials. The portfolio and all other application materials should be submitted to the Office of Graduate Admissions. For more information, contact the School of Art at 703-993-8898.

**Studios**

The School of Art is located in the Art and Design Building which houses well equipped studios for drawing, painting, photography, printmaking, and sculpture, as well as six computer-equipped studios that cross platforms and are installed with current software applications used for two dimensional imaging, three-dimensional modeling, animation, video production, sound editing, multimedia authoring, photography, and web publishing.

Policies, procedures, and schedules for studio use are established by the AVT studio faculty and are posted in the studios.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Degree Requirements**

**Core Courses (19 credits)**

- 8 Credits of Graduate Studio Elective (students choose from Digital Arts, Drawing, Painting, Photography, Printmaking, or Sculpture 500+ level)
- AVT 611 - Graduate Design Seminar Credits: 1 (Must be taken for a total of 3 credits)
- AVT 612 - Independent Project Research Credits: 1
- AVT 613 - Graphic Design History Credits: 3
- AVT 617 - Advanced Typography Credits: 4

**Elective Courses (13 credits)**

- AVT 614 - Brand Identity Design Credits: 4
- AVT 619 - Advanced Web Design Credits: 4
- 1-5 credits of AVT 596 - Independent Study Credits: 1-6
- 1-5 credits of AVT 599 - Special Topics in Art and Visual Technology Credits: 1-6

**Final Project (4 credits)**

The final steps for completion of the MA in Graphic Design are a substantial final project that calls upon all the skills of a working designer.

- AVT 794 - Independent Design Project Credits: 4
Total: 36 credits

Master's Level Certificate

Art Education Licensure Certificate

Banner Code: AR-CERG-ARTL

Following this curriculum does not guarantee entry into the Master of Art Teaching (MAT) Program. Prospective MAT students must meet all MAT admissions requirements as described in the catalog.

Admission Requirements

In addition to meeting the general university admission requirements, admission to the licensure program is contingent on completion of a BFA, BA in art or approved equivalent along with a minimum 3.00 cumulative undergraduate GPA. Eligibility for the Art Education Licensure Certificate program may demand additional course work to establish proficiency in visual arts. Students will be required to satisfy the required state endorsement courses prior to student teaching.

Applications will be accepted for fall and spring semesters. The deadline for receipt of application materials is October 1 for Spring and April 1 for Fall. Each applicant must provide the following materials:

- Completed application form
- Certified copies of all undergraduate transcripts and any graduate transcripts
- Statement of intent and professional goals for entering the field
- Three letters of reference from faculty members or individuals who have firsthand knowledge of the applicant's academic or professional capabilities
- Official passing score on Praxis I or SAT equivalent
- TOEFL score, if required by Mason policies
- Portfolio of 15-20 images that reflect artistic breadth and depth, including drawing skills of the applicant's art. The work should be in Power Point format on a Mac-compatible CD. All portfolios must include a written image sheet with the corresponding number, title, date, medium, and size of each work. Incomplete portfolios will not be considered. Applicants' portfolio items are considered part of the application for admission and, thus, cannot be returned. Please do not send original materials.

The portfolio and all other application materials should be submitted to the Office of Graduate Admissions. Qualified applicants will be invited to an on-campus interview, portfolio review of original art works, and in-person writing sample.

Diversity among students is another consideration for acceptance into the program. Applicants with degrees in areas other than art are welcome, although they may be required to complete undergraduate core, and studio and art history courses.

The Art Education Licensure Certificate is a post-baccalaureate program designed for those who currently hold a graduate degree in an art-related field along with those who want a more immediate entrance into the art teaching profession. This "licensure only" program, which results in a pre K-12 art certification in the Commonwealth of Virginia, is a 21 credit program consisting of graduate education courses, art endorsements, student teaching internships and seminar. There is a MAT Graduate Degree option with an additional 9 graduate credits.
International students may be required to undergo an additional audit of their undergraduate transcripts. This certificate may be earned either on a part time or full time basis.

Certificate Requirements

- AVT 595 - Introduction to Art Teaching and Learning Credits: 3
- AVT 691 - Elementary Art Education Credits: 3
- AVT 692 - Secondary Art Education Credits: 3
- EDRD 501 - Literacy and Curriculum Integration, PK-12 Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3
  Prior to internship, student must pass: Praxis II, VCLA, technology and child abuse standards to receive placement for student teaching.
- AVT 695 - Internship in Art Education (Student Teaching) Credits: 5
- AVT 696 - Internship for Student Teachers Credits: 1

Total: 21 credits

All Licensure Certificate students will receive ongoing evaluations by the art education faculty to determine their readiness for student teaching.

In addition, applicants who did not take equivalent undergraduate courses will be required to take AVT 180 - New Media in the Creative Arts, art education endorsements plus any additional studio or art history course work to meet Virginia licensure requirements.

Arts Management

3330 N. Washington Boulevard
Arlington, VA 22201
Phone: 703-993-8926
Web: artsmanagement.gmu.edu

Faculty

Richard Kamenitzer, Program Director
Nicole Springer, Assistant Director Professional Development

Professor: Reeder

Associate Professors: Kamenitzer (program director), Marcus

Assistant Professors: Dawn, Rosenstein

Adjunct Faculty: Allen, Berardelli, Bienvenu, Bursten, Case, Corbett, Denhardt-Cissna, Goldstein, Herrmann, Hill, Huschle, Johnson, Kaiser, Lopez, Madden, Salmon, Simpson, Smith, Smyers, Springer, Sweet, Thompson

Course Work
The Arts Management Program offers all course work designated AMGT in the Courses chapter of this catalog.

Undergraduate Program

Arts Management Minor

The field of visual and performing arts offers many career paths that rely on a strong foundation in one or more art forms and require specific knowledge and skills in administration and management. The minor in arts management is open to all CVPA majors as well as art history majors. All other students must complete 9 credits of arts-related course work to be eligible for this minor.

Graduate Certificate

Arts Management

The Arts Management certificate is intended for those who know the specific expertise they desire to acquire to either enter into or advance arts management or related careers. Students successfully complete fifteen (15) credits in an area of emphasis including Marketing and Public Relations in the Arts, Entrepreneurship in the Arts, Programming and Project Management in the Arts, and Fundraising and Development in the Arts.

Completed applications must be received by March 1 for fall and October 15 for spring. International applicants: Completed applications must be received by February 15 for fall and September 15 for spring.

MA in Arts Management

The MA in arts management responds to a growing demand for graduates who can manage and coordinate the arts, bridging the world of performing and visual arts with applied managerial skills. The Washington, D.C., region is home to one of the nation’s largest concentrations of performing and visual arts organizations. The demand for arts managers with skills in financial and budgetary management, strategic management and entrepreneurship, and public relations, including marketing and advertising, has arguably never been more acute. The need for arts managers with skills in philanthropy, fund raising, and ongoing relationship-building management among the private and public arts sectors also continues to grow at a fast pace.

The MA is a 36-credit program of study that provides a core curriculum in the fundamentals of arts management. Students complete a 24-credit core and then select 6 credits of approved elective courses. Students also take internal and external internships. The internal internship affords an in-depth opportunity to work with professionals in residence at Mason’s Center for the Arts. The external internship provides the opportunity to work at more than 60 different visual and performing arts venues in the Washington, D.C. metropolitan area.

Admissions Requirements

The program is geared toward those with a passion for the arts. Diversity among applicants is anticipated and sought, and candidates are evaluated on a case-by-case basis. Work experience is strongly preferred. It is anticipated that applicants will come from the arts community, with experience and training in music, dance, theater, and visual and technical arts and wish to add the skills of marketing, finance, strategy, entrepreneurship, and management to their repertoire. It is also expected that students will enter with more developed skills in the business side of the arts and wish to unite these skills with prior experiences in the arts.

Completed applications must be received by March 1 for fall and October 15 for spring. International applicants: Completed applications must be received by February 15 for fall and September 15 for spring.
In addition to meeting general requirements for university admission for graduate study, applicants must submit the following items:

- Official undergraduate transcripts listing a four-year bachelor’s degree from an accredited institution
- Two letters of recommendation from faculty members or individuals who have first-hand knowledge of the applicant’s academic or professional capabilities
- A two-page (maximum) statement of intent and goals
- Resume

Applicants might be asked to interview with at least one member of the program faculty or Admissions Committee. In addition, applicants may submit a portfolio that demonstrates work experience. Internship experience for recent graduates will also be considered.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Undergraduate Interdisciplinary Minor**

**Arts Management Minor**

**Banner Code:** AMGT

3330 N. Washington Boulevard
Arlington, VA 22201
Phone: 703-993-8926

**Faculty**

Kamenitzer, Director

Springer, Assistant Director Professional Development and Undergraduate minor coordinator

The field of visual and performing arts offers many career paths that rely on a strong foundation in one or more art forms and require specific knowledge and skills in administration and management. The minor in arts management is open to all CVPA majors as well as art history majors. All other students must complete 9 credits of arts-related course work to be eligible for this minor.

University policy states that students must earn 8 distinct credits that are not used toward their major toward their minor.

**Course Work**

The minor in arts management consists of 18 credits, including:

- AMGT 405 - Seminar in Arts Management Credits: 3
- 3-4 credits of AMGT 489 - Internship in Arts Management Credits: 1-4
- MGMT 301 - People and Organizations Credits: 3
Mini-Courses

Choose 2-3 credits from:

- AMGT 402 - Professional Development Credits: 1
- AMGT 470 - Academic Writing in the Arts Credits: 1
- AMGT 471 - Introduction to Grant Writing Credits: 1

Electives

Choose 6 credits from the following:

- AVT 307 - Aesthetics Credits: 3
- AVT 309 - Art as Social Action Credits: 3
- DANC 390 - Dance History I Credits: 3
- DANC 391 - Dance History II Credits: 3
- GAME 230 - History of Computer Game Design Credits: 3
- THR 201 - Stage Management Credits: 1
- THR 202 - Literary Management Credits: 1
- THR 203 - Production/Company Management Credits: 1
- THR 355 - Moral Vision in American Theater Credits: 3
- THR 359 - World Stages Credits: 3
- THR 395 - Theater as the Life of the Mind Credits: 3
- AVT 392 - Gallery Practices Credits: 4
- AVT 395 - Writing for Artists Credits: 3
- DANC 270 - Dance Production Lab Credits: 1
- DANC 318 - Global Perspectives: World Dance Forms Credits: 3
- DANC 372 - Advanced Dance Production Credits: 1
- FAVS 352 - Ethics of Film and Video Credits: 3
- FAVS 355 - Film Business Practices Credits: 3
- MUSI 331 - Music History in Society I Credits: 3
- MUSI 332 - Music History in Society II Credits: 3
- MUSI 393 - Music Administration and Management Credits: 2
- MUSI 401 - Impact of the Arts on Civilization Credits: 3
- ARTH 374 - Art Now Credits: 3
- ARTH 394 - The Museum Credits: 3
- COMM 300 - Foundations of Public Communication Credits: 3

Note: the above courses may have prerequisites that must be met; see individual course descriptions for details.

Total: 18 credits

Master's Degree
Arts Management, MA

Banner Code: AR-MA-AMGT

3330 N. Washington Boulevard
Arlington, VA 22201
Phone: 703-993-8926
Web: artsmanagement.gmu.edu

Faculty

Richard Kamenitzer, Program Director
Nicole Springer, Assistant Director Professional Development

Professor: Reeder

Associate Professors: Kamenitzer (program director), Marcus

Assistant Professors: Dawn, Rosenstein

Adjunct Faculty: Allen, Berardelli, Bienvenu, Bursten, Case, Corbett, Denhardt-Cisna, Goldstein, Herrmann, Hill, Huschle, Johnson, Kaiser, Lopez, Madden, Salmon, Simpson, Smith, Smyers, Springer, Sweet, Thompson

Course Work

The Arts Management program offers all course work designated AMGT in the Course Descriptions chapter of this catalog.

Program

The MA in arts management responds to a growing demand for graduates who can manage and coordinate the arts, bridging the world of performing and visual arts with applied managerial skills. The Washington, D.C., region is home to one of the nation’s largest concentrations of performing and visual arts organizations. The demand for arts managers with skills in financial and budgetary management, strategic management and entrepreneurship, and public relations, including marketing and advertising, has arguably never been more acute. The need for arts managers with skills in philanthropy, fund raising, and ongoing relationship-building management among the private and public arts sectors also continues to grow at a fast pace.

The MA is a 36-credit program of study that provides a core curriculum in the fundamentals of arts management. Students complete a 24-credit core and then select 6 credits of approved elective courses. Students also take internal and external internships. The internal internship affords an in-depth opportunity to work with professionals in residence at Mason’s Center for the Arts. The external internship provides the opportunity to work at more than 60 different visual and performing arts venues in the Washington, D.C. metropolitan area.

Admissions Requirements

The program is geared toward those with a passion for the arts. Diversity among applicants is anticipated and sought, and candidates are evaluated on a case-by-case basis. Work experience is strongly preferred. It is anticipated that applicants will come from the arts community, with experience and training in music, dance, theater, and visual and technical arts and wish to add the skills of marketing, finance, strategy, entrepreneurship, and management to their repertoire. It is also expected that students will
enter with more developed skills in the business side of the arts and wish to unite these skills with prior experiences in the arts. Completed applications must be received by March 1 for fall and October 15 for spring. International applicants: Completed applications must be received by February 15 for fall and September 15 for spring.

In addition to meeting general requirements for university admission for graduate study, applicants must submit the following items:

- Official undergraduate transcripts listing a four-year bachelor’s degree from an accredited institution
- Two letters of recommendation from faculty members or individuals who have first-hand knowledge of the applicant’s academic or professional capabilities
- A two-page (maximum) statement of intent and goals
- Resume

Applicants might be asked to interview with at least one member of the program faculty or Admissions Committee. In addition, applicants may submit a portfolio that demonstrates work experience. Internship experience for recent graduates will also be considered.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Degree Requirements**

**Core Requirements (24 credits)**

Elective courses at the 600 or higher course level may be taken only after a candidate has completed and/or registered for at least 12 core course credits. Students are required to successfully complete AMGT 602 - Seminar in Arts Management within their first 12 credits.

- AMGT 601 - Fund Raising/Development I Credits: 3
- AMGT 602 - Seminar in Arts Management Credits: 3
- AMGT 603 - Arts and Society Credits: 3
- AMGT 604 - Public Relations and Marketing Strategies for the Arts I Credits: 3
- AMGT 606 - Board of Directors Management Credits: 3
- AMGT 704 - Finance and Budgeting for Arts I Credits: 3
- AMGT 705 - Finance and Budgeting for Arts II Credits: 2
- AMGT 710 - Arts Policy Credits: 3
- AMGT 795 - Capstone in Arts Management Credits: 1

**Internships (6 credits)**

- AMGT 740 - Internal Internship Credits: 2
  (Or 2 credits of approved electives for those students who have a minimum of 2000 hours of work in an arts management or related field)
- AMGT 790 - External Internship Credits: 1-4 (Students must take a total of 4 credits)

**Electives (6 credits)**
Arts Management MA candidates who are also Arts Management certificate candidates may apply only 3 credits of these electives to an Arts Management certificate. Arts Management joint MA/certificate candidates in Marketing and Public Relations in the Arts, Fundraising and Development in the Arts, and Program and Project Management in the Arts areas of emphasis must complete a minimum of 45 credits, 9 of which are unique to the certificate. Arts Management joint MA/certificate candidates in the Entrepreneurship in the Arts emphasis must complete a minimum of 45 credits, 7 of which are unique to the certificate.

Select 6 credits from the following:

- AMGT 504 - Professional Development Arts Management Credits: 1
- AMGT 505 - Academic Writing in Arts Management Credits: 1
- AMGT 511 - Introduction to Grant Writing Credits: 1
- AMGT 525 - Introduction to Technology for PR and Marketing in the Arts Credits: 1
- AMGT 526 - Applied Technology Projects for PR and Marketing in the Arts Credits: 1
- AMGT 527 - Selected Readings for PR and Marketing in the Arts Credits: 1
- AMGT 545 - Introduction to Technology for Programming and Project Management in the Arts Credits: 1
- AMGT 546 - Applied Technology Projects for Programming and Project Management in the Arts Credits: 1
- AMGT 547 - Selected Readings for Programming and Project Management in the Arts Credits: 1
- AMGT 555 - Introduction to Technology for Fundraising and Development in the Arts Credits: 1
- AMGT 556 - Applied Technology Projects for Fundraising and Development in the Arts Credits: 1
- AMGT 557 - Selected Readings for Fundraising and Development in the Arts Credits: 1
- AMGT 599 - Special Topics in Arts Management Credits: 1-6
- AMGT 607 - Fund Raising/Development II Credits: 3
- AMGT 608 - Public Relations and Marketing Strategies for the Arts II Credits: 3
- AMGT 609 - Facilities Management Credits: 3
- AMGT 610 - Gallery Management Credits: 3
- AMGT 620 - Legal Aspects in Arts Management Credits: 3
- AMGT 630 - Viral Marketing and Social Media for the Arts Credits: 3
- AMGT 640 - Programming and Project Management in the Arts Credits: 3
- AMGT 650 - Major Gifts and Capital Campaigns Credits: 3
- AMGT 706 - Festivals and Special Events Credits: 3
- AMGT 711 - Directed Readings and Project Credits: 1-6
- AMGT 712 - Grant Writing in the Arts Credits: 3
- AMGT 750 - Arts Entrepreneurship I Credits: 3
- AMGT 751 - Arts Entrepreneurship II Credits: 3
- AMGT 760 - Current Issues in Arts Management Credits: 3
- AMGT 780 - Arts Consultancy Credits: 3

Total: 36 credits

Master's Level Certificate

Arts Management Graduate Certificate

Banner Code: AR-CERG-AMGT
Faculty

Richard Kamenitzer, Program Director
Nicole Springer, Assistant Director Professional Development

Professor: Reeder

Associate Professors: Kamenitzer (program director), Marcus

Assistant Professors: Dawn, Rosenstein

Adjunct Faculty: Allen, Berardelli, Bienvenu, Bursten, Case, Corbett, Denhardt-Cissna, Goldstein, Herrmann, Hill, Huschle, Johnson, Kaiser, Lopez, Madden, Salmon, Simpson, Smith, Smyers, Springer, Sweet, Thompson

Admission Requirements

- GPA 3.0
- Official undergraduate transcripts listing a four-year bachelor's degree from an accredited institution
- Two letters of recommendation from faculty members or individuals who have first-hand knowledge of the applicant's academic or professional capabilities.
- A two-page (maximum) statement of intent and goals
- Applicants might be asked to interview with at least one member of the program faculty or Admissions Committee. In addition, applicants may submit a portfolio that demonstrates work experience.

This graduate certificate may be pursued on a part time or full time basis.

Certificate Requirements

Applicants must complete course work in one of the following areas:

Entrepreneurship in the Arts

- AMGT 525 - Introduction to Technology for PR and Marketing in the Arts Credits: 1
- AMGT 603 - Arts and Society Credits: 3
- AMGT 704 - Finance and Budgeting for Arts I Credits: 3
- AMGT 705 - Finance and Budgeting for Arts II Credits: 2
- AMGT 750 - Arts Entrepreneurship I Credits: 3
- AMGT 751 - Arts Entrepreneurship II Credits: 3

Fundraising and Development in the Arts
- AMGT 555 - Introduction to Technology for Fundraising and Development in the Arts Credits: 1
- AMGT 556 - Applied Technology Projects for Fundraising and Development in the Arts Credits: 1
- AMGT 557 - Selected Readings for Fundraising and Development in the Arts Credits: 1
- AMGT 601 - Fund Raising/Development I Credits: 3
- AMGT 607 - Fund Raising/Development II Credits: 3
- AMGT 650 - Major Gifts and Capital Campaigns Credits: 3
- AMGT 712 - Grant Writing in the Arts Credits: 3

Marketing and PR in the Arts

- AMGT 525 - Introduction to Technology for PR and Marketing in the Arts Credits: 1
- AMGT 526 - Applied Technology Projects for PR and Marketing in the Arts Credits: 1
- AMGT 527 - Selected Readings for PR and Marketing in the Arts Credits: 1
- AMGT 604 - Public Relations and Marketing Strategies for the Arts I Credits: 3
- AMGT 608 - Public Relations and Marketing Strategies for the Arts II Credits: 3
- AMGT 630 - Viral Marketing and Social Media for the Arts Credits: 3
- AMGT 620 - Legal Aspects in Arts Management Credits: 3

Programming and Project Management in the Arts

- AMGT 545 - Introduction to Technology for Programming and Project Management in the Arts Credits: 1
- AMGT 546 - Applied Technology Projects for Programming and Project Management in the Arts Credits: 1
- AMGT 547 - Selected Readings for Programming and Project Management in the Arts Credits: 1
- AMGT 601 - Fund Raising/Development I Credits: 3 or AMGT 604 - Public Relations and Marketing Strategies for the Arts I Credits: 3
- AMGT 609 - Facilities Management Credits: 3
- AMGT 640 - Programming and Project Management in the Arts Credits: 3
- AMGT 706 - Festivals and Special Events Credits: 3

Total: 15 credits

❖ Computer Game Design

Art and Design Building, Room 2020
Phone: 703-993-5734
Web: game.gmu.edu
Faculty

Scott Martin, Program Director
Seth Hudson, Assistant Director

Associate Professor: Martin (program director)
Term Assistant Professors: Grimsby, Willis, Wren

Undergraduate Program

The 120 credit Computer Game Design program enables students to focus on the artistic components of computer game design while providing them with the technical skills prerequisite to the field. Required courses include computer science, art and visual technology, music, the humanities, and computer game design. The required internship provides students with practical experience that enhances their employability postgraduation.

Portfolio Requirement

Effective Fall 2011 students who wish to apply for the Computer Game Design BFA program must submit a portfolio.

The portfolio should include 10-15 examples of student work, at least half of which must be from studio art courses. Examples may include drawing, painting, sculpture, 2 or 3D digital art, prints, animation, models, characters, music, websites (URLs), or game levels. Applicants may include game design documents, scripts and stories, or game code (Script, C++, JAVA). The portfolio must be neatly organized and clearly labeled with name and desired major on the outside. Call 703-993-5158 to schedule a portfolio review.

Course Work

The Computer Game Design Program offers all course work designated GAME in the Courses chapter of this catalog.

Writing-Intensive Requirement

The university requires all students to complete at least one course designated "writing intensive" in their majors at the 300 level or above. Students in the BFA in computer game design fulfill this requirement by successfully completing GAME 332.

Upper-Level Credits

All undergraduate students are required to complete a minimum of 45 credits of upper-division courses at the 300-499 level.

Major GPA

All GAME undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

All GAME courses except GAME 101, GAME 250 and GAME 367 must be passed with a grade of C or better.

Academic Policies
Please see College of Visual and Performing Arts for college academic policies.

**Undergraduate Degree**

**Computer Game Design, BFA**

**Banner Code: AR-BFA-GAME**

Art and Design Building, Room 2020  
Phone: 703-993-5734  
Web: game.gmu.edu

**Faculty**

Scott Martin, Program Director  
Seth Hudson, Assistant Director

**Associate Professor:** Martin (program director)  
**Term Assistant Professors:** Grimsby, Willis, Wren

The 120 credit Computer Game Design program enables students to focus on the artistic components of computer game design while providing them with the technical skills prerequisite to the field. Required courses include computer science, art and visual technology, music, the humanities, and computer game design. The required internship provides students with practical experience that enhances their employability postgraduation.

**Portfolio Requirement**

Effective Fall 2011 students who wish to apply for the Computer Game Design BFA program must submit a portfolio.

The portfolio should include 10-15 examples of your work, at least half of which must be from studio art courses. Examples may include drawing, painting, sculpture, 2 or 3D digital art, prints, animation, models, characters, music, websites (URLs), or game levels. Applicants may include game design documents, scripts and stories, or game code (Script, C++, JAVA). The portfolio must be neatly organized and clearly labeled with name and desired major on the outside. Call 703-993-5158 to schedule a portfolio review.

**Course Work**

The Computer Game Design program offers all course work designated GAME in the Courses chapter of this catalog.

All GAME courses except GAME 101, GAME 250 and GAME 367 must be passed with a grade of C or better.

**Writing-Intensive Requirement**

The university requires all students to complete at least one course designated "writing intensive" in their major at the 300-level or above. Students in the BFA in computer game design fulfill this requirement by successfully completing GAME 332.
Upper-Level Credits

All undergraduate students are required to complete a minimum of 45 credits of upper-division courses at the 300-499 level.

Major GPA

All GAME undergraduate students must earn a minimum 2.00 cumulative GPA in their major.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

Degree Requirements

General Education (43 credits)

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as 302, to fulfill degree requirements.
- AVT 180 - New Media in the Creative Arts Credits: 3
- CS 105 - Computer Ethics and Society Credits: 1
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MUSI 100 - Fundamentals of Music Credits: 3
- PHYS 103 - Physics and Everyday Phenomena I Credits: 4
- PSYC 100 - Basic Concepts in Psychology Credits: 3
- DANC 118 - World Dance Credits: 3 or MUSI 103 - Musics of the World Credits: 3

Oral Communication, Literature, Natural Science including Lab, Western Civilization, and Synthesis

Approved courses may be found under the University General Education section of this catalog.

Major Core (59 credits)

- AVT 104 - Studio Fundamentals I Credits: 4
- AVT 280 - Introduction to New Media Arts Credits: 4
- CS 112 - Introduction to Computer Programming Credits: 4
• GAME 210 - Basic Game Design Credits: 3
• GAME 230 - History of Computer Game Design Credits: 3
• GAME 231 - Computer Animation for Games Credits: 3
• GAME 232 - Online and Mobile Gaming Credits: 3
• GAME 250 - Music for Film and Video Credits: 3
• GAME 310 - Game Design Studio Credits: 3
• GAME 330 - Computer Game Platform Analysis Credits: 3
• GAME 331 - Consumer Gaming Platform Analysis Lab Credits: 1
• GAME 332 - Story Design for Computer Games Credits: 3
• GAME 367 - Writing and Editing Music and Sound Credits: 3
• GAME 398 - Advanced Game Design Animation Credits: 3
• GAME 410 - Advanced Game Design Studio Credits: 3
• GAME 489 - Pre-Internship Seminar Credits: 1
• GAME 490 - Senior Project Credits: 2-6 (Must be taken for 6 credits)
• GAME 491 - Internship Credits: 3
• MUSI 101 - Introduction to Classical Music Credits: 3

Digital Media Electives (at least 10 credits)
Select three courses from the following in different disciplines (one from AVT required or advisor's approval)

• AVT 354 - Digital Photo Techniques Credits: 4
• AVT 382 - 2D Experimental Animation Credits: 4
• AVT 383 - 3D Experimental Animation Credits: 4
• AVT 390 - Video Art Credits: 4
• AVT 482 - Advanced Image Making Credits: 4
• AVT 487 - Advanced Topics: New Media Art Credits: 4
• COMM 355 - Video Principles and Practices Credits: 3
• FAVS 399 - Special Topics in Film and Video Studies Credits: 1-3
• GAME 399 - Special Topics Credits: 1-4

Visual Arts Electives (8 credits)
Select two courses from the following

• AVT 215 - Typography Credits: 4
• AVT 222 - Drawing I Credits: 4
• AVT 232 - Painting I Credits: 4
• AVT 243 - Printmaking I Credits: 4
• AVT 252 - Fundamentals of Photography Credits: 4
• AVT 262 - Sculpture I Credits: 4
• AVT 311 - Graphic Design Methods and Principles Credits: 4
• AVT 323 - Drawing II Credits: 4
• AVT 324 - Figure Drawing Credits: 4
• AVT 333 - Painting II Credits: 4
• AVT 337 - Figurative Painting Credits: 4
AVT 343 - Printmaking II Credits: 4
AVT 363 - Sculpture II Credits: 4

Total: 120 credits

Undergraduate Minor

Computer Game Design Minor

Banner Code: GAME

Art and Design Building, Room 2020
Phone: 703-993-5734
Web: game.gmu.edu

The minor (18-19 credits) embodies the core components discovered in the larger game design field. It offers a core of foundational studies with intermediate and advanced course options in game animation, game sound and music, or game design and development. Students pursuing the minor will be able to participate in game program events, special activities, game design competitions, and in most projects hosted in the Computer Game Design Research Studio.

University policy states that students must earn 8 distinct credits that are not used for their major toward their minor. This minor is not intended for game design majors.

Requirements

The minor requires 18 credits, including:

- GAME 101 - Introduction to Game Design Credits: 3
- GAME 210 - Basic Game Design Credits: 3
- GAME 230 - History of Computer Game Design Credits: 3
- GAME 400 - Game Design Practicum Credits: 3

and a two or three-course sequence from the following:

- GAME 231 - Computer Animation for Games Credits: 3 and GAME 398 - Advanced Game Design Animation Credits: 3
- OR
- GAME 232 - Online and Mobile Gaming Credits: 3 and GAME 330 - Computer Game Platform Analysis Credits: 3 and GAME 331 - Consumer Gaming Platform Analysis Lab Credits: 1
- OR
- GAME 250 - Music for Film and Video Credits: 3 and GAME 367 - Writing and Editing Music and Sound Credits: 3

Total: 18-19 credits
School of Dance

Performing Arts Building, Room A300
Phone: 703-993-1114
Web: dance.gmu.edu

Faculty

Elizabeth Price, Director

Professors: Lepore, Miller, Shields

Associate Professors: Joyce, Price (director), Studd

Assistant Professor: d’Amboise (Heritage Professor)

Term Assistant Professors: Reedy, Torres-Ortiz

Adjunct Faculty: Clancy, Cronmiller, Dinapoli, Goodson, Haynes, Lee, Nuamah, Summerall, Urgelles, Windom

Course Work

The School of Dance offers all course work designated DANC in the Courses chapter of this catalog.

Undergraduate Programs

The School of Dance offers a BFA and a BA. Entrance to either program is by audition. Information about the audition process, including dates and audition application, can be found on the school web page, dance.gmu.edu, or by calling the dance office at 703-993-1114. Admission to the university is determined by the Admissions Office.

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their major at the 300-level or above. Students in the BFA and BA in dance fulfill this requirement by successfully completing DANC 390 or 391.

Certification to Teach

This program is approved by the Virginia State Department of Education and administered through the College of Education and Human Development, which is accredited by the National Council for the Accreditation of Teacher Education (NCATE). To be considered for licensure in dance education, a student must successfully complete requirements for a BA or BFA in dance. In addition, students must meet the following requirements:

- Be formally accepted into the program by the Dance Education Committee. Before requesting an interview with the committee, students must complete 45 to 60 credits with a GPA of 2.80 or higher, and submit passing scores for the Praxis I tests (Reading, Writing, Mathematics). It is strongly recommended that students take the Praxis I tests as soon as they have completed ENGH 302, a course in literature, and a course in mathematics.
- Earn no grade lower than a C in dance (see major curriculum) and in professional education courses (EDUC 301, 302; EDRD 300; DANC 453, 454).
• Maintain an overall GPA of 2.80 or higher in all dance course work at Mason and at all other institutions of higher learning combined.
• As dance elective options, complete DANC 118 World Dance, DANC 453 Teaching Creative Movement, and DANC 131 Beginning Jazz Technique or 231 Intermediate Jazz Technique.
• With committee approval, register for and complete EDUC 301 and 302 and EDRD 300.
• After completing all required course work and with committee approval, submit passing scores on the VLCA and complete a full-time 15-week student teaching internship (DANC 455) that includes experiences at both elementary and middle or secondary levels.

This course of study will require a post-baccalaureate semester.

Graduate Program

The MFA in dance is a highly selective 60-credit program of study grounded in the modern dance genre that emphasizes mastery in performance, choreography, and teaching in higher education. Applicants must have significant (5 years or more) professional performance experience in modern or ballet at the national or international level. They must also demonstrate professional competence in choreography as exemplified by a significant body of work and have experience teaching technique at the advanced level.

Admission Requirements

In addition to fulfilling the admission requirements for graduate study, the applicant must submit directly to the School of Dance a résumé, artistic statement including artistic goals, and a 15-minute video of original choreography.

All candidates must satisfy the following prerequisites: advanced dance technique, improvisation, dance composition, history, anatomy/kinesiology, and dance production. Prerequisite courses are usually fulfilled if the applicant has earned a BA or BFA in dance.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Undergraduate Degree

Dance, BA

Banner Code: AR-BA-DANC

Performing Arts Building, Room A300
Phone: 703-993-1114
Web: dance.gmu.edu

Faculty

Elizabeth Price, Director

Professors: Lepore, Miller, Shields
**Undergraduate Program**

The BA degree is a 120-credit general program of dance study within a liberal arts degree framework. Entrance to the program is by audition. Information about the audition process, including dates and audition application, can be found on the school webpage, dance.gmu.edu, or by calling the dance office at 703-993-1114. Admission to the university is determined by the Admissions Office.

**Course Work**

The School of Dance offers all course work designated DANC in the Courses chapter of this catalog.

**Writing-Intensive Requirement**

The university requires all students to complete at least one course designated “writing intensive” in their major at the 300-level or above. Students in the BFA and BA in dance fulfill this requirement by successfully completing DANC 390 or 391.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Certification to Teach**

This program is approved by the Virginia State Department of Education and administered through the College of Education and Human Development, which is accredited by the National Council for the Accreditation of Teacher Education (NCATE). To be considered for licensure in dance education, a student must successfully complete requirements for a BA or BFA in dance. In addition, students must meet the following requirements:

- Be formally accepted into the program by the Dance Education Committee. Before requesting an interview with the committee, students must complete 45 to 60 credits with a GPA of 2.80 or higher, and submit passing scores for the Praxis I tests (Reading, Writing, Mathematics). **It is strongly recommended that students take the Praxis I tests as soon as they have completed ENGH 302, a course in literature, and a course in mathematics.**
- Earn no grade lower than a C in dance (see major curriculum) and in professional education courses (EDUC 301, 302; EDRD 300; DANC 453, 454).
- Maintain an overall GPA of 2.80 or higher in all dance course work at Mason and at all other institutions of higher learning combined.
- As dance elective options, complete DANC 118 World Dance, DANC 453 Teaching Creative Movement, and DANC 131 Beginning Jazz Technique or 231 Intermediate Jazz Technique.
- With committee approval, register for and complete EDUC 301 and 302 and EDRD 300.
- After completing all required course work and with committee approval, submit passing scores on the VLCA and complete a full-time 15-week student teaching internship (DANC 455) that includes experiences at both elementary and middle or secondary levels.
This course of study will require a post-baccalaureate semester.

Degree Requirements

General Education (49-58 credits)

Foundation

Written Communication:

Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3

Foundation Requirements:

- Oral communication Credits: 3
- Quantitative reasoning Credits: 3
- Information technology Credits: 3

Core Requirements

- Literature Credits: 3
- Natural science (must include a laboratory science) Credits: 7
- Western civilization Credits: 3
- Global understanding Credits: 3
- Social science Credits: 3
- Philosophy or religion Credits: 3
- Arts Credits: 9
  - AVT/ARTH Credits: 3
  - THR 210 - Acting I Credits: 3
  - Choose one of the following Credits: 3
    - MUSI 101 - Introduction to Classical Music
    - MUSI 102 - Popular Music in America
    - MUSI 103 - Musics of the World
    - MUSI 104 - Introduction to Twentieth-Century Music
    - MUSI 105 - Music in the United States

Synthesis
• DANC 490 - Senior Dance Seminar Credits: 3

Foreign Language (0-9 credits)

• Elementary (6)
• Intermediate (3–6)

Dance Major Core (47 credits)

• DANC 114 - Rhythmic Analysis and Music Resources for Dance Credits: 3
• DANC 150 - Dance Improvisation Credits: 3
• DANC 170 - Orientation to Dance Production Credits: 1
• DANC 190 - First Year Seminar Credits: 1
• DANC 210 - Dynamic Alignment Credits: 3
• DANC 251 - Dance Composition I Credits: 3
• DANC 252 - Dance Composition II Credits: 3
• DANC 270 - Dance Production Lab Credits: 1
• DANC 370 - Dance Performance Credits: 0-1 (must be taken for 2 credits)
• DANC 390 - Dance History I Credits: 3
• DANC 391 - Dance History II Credits: 3
• DANC 454 - Methods of Teaching Dance Credits: 3
• DANC 410 - Introduction to Contemporary Movement Theories Credits: 3 or DANC 480 - Introduction to Laban Movement Analysis Credits 3

Choose 6 credits from the following:
• DANC 325 - Intermediate Modern Dance Credits: 1-3
• DANC 445 - Advanced Modern Dance Credits: 1-3

Choose 3 credits from the following:
• DANC 345 - Intermediate Ballet Credits: 1-3
• DANC 445 - Advanced Ballet Credits: 1-3

Dance Electives (6 credits)

Choose from the following:

• DANC 118 - World Dance Credits: 3
• DANC 119 - Dance in Popular Culture: Afro-Latino Dance Credits: 3
• DANC 120 - Special Topics in Dance Credits: 1-3
• DANC 131 - Beginning Jazz Technique Credits: 3
• DANC 161 - Beginning Tap Dance Credits: 3
• DANC 225 - Beginning Intermediate Modern Dance Credits: 3
• DANC 245 - Beginning Intermediate Ballet Credits: 3
• DANC 318 - Global Perspectives: World Dance Forms Credits: 3
• DANC 324 - Introduction to Dance Conditioning Credits: 1-3
• DANC 325 - Intermediate Modern Dance Credits: 1-3
• DANC 326 - Dance Performance Practicum Credits: 0-1
• DANC 331 - Advanced Jazz Dance Credits: 3
• DANC 345 - Intermediate Ballet Credits: 1-3
• DANC 362 - Directed Choreography Credits: 1
• DANC 370 - Dance Performance Credits: 0-1
• DANC 371 - Residency Workshop Credits: 0-1
• DANC 399 - Independent Study Credits: 1-3
• DANC 410 - Introduction to Contemporary Movement Theories Credits: 3
• DANC 418 - Global Dance Intensive Credits: 1-3
• DANC 420 - Special Topics in Dance Credits: 1-3
• DANC 425 - Advanced Modern Dance Credits: 1-3
• DANC 445 - Advanced Ballet Credits: 1-3
• DANC 453 - Teaching Creative Movement Credits: 3
• DANC 455 - Teaching Practicum Credits: 1-6

Note:
Additional technique and performance credits beyond those required in the major core may be applied to dance electives

Elective Credits (15-24)

Total: 120 credits

Dance, BFA

Banner Code: AR-BFA-DANC

Performing Arts Building, Room A300
Phone: 703-993-1114
Web: dance.gmu.edu

Faculty

Elizabeth Price, Director

Professors: Lepore, Miller, Shields

Associate Professors: Joyce, Price (director), Studd

Assistant Professor: d'Amboise (Heritage Professor)

Term Assistant Professors: Reedy, Torres-Ortiz

Adjunct Faculty: Clancy, Cronmiller, Dinapoli, Goodson, Haynes, Lee, Nuamah, Summerall, Urgelles, Windom
Undergraduate Program

The BFA in dance is a performance-oriented modern dance program designed to prepare students professionally as performers, choreographers, and teachers, as well as prepare them for graduate study. Students in this program demonstrate significant technical mastery and devote a large portion of their college study to an intensive and comprehensive dance curriculum.

Daily technical training in modern dance and ballet, and opportunities to study jazz and world dance forms develops a versatile dancer. Student progress in the BFA program is assessed annually. Because of the professional nature of the BFA degree, the program requires completion of 126 credits of course work.

Entrance to the program is by audition. Information about the audition process, including dates and audition application, can be found on the school web page, dance.gmu.edu, or by calling the dance office at 703-993-1114. Admission to the university is determined by the Admissions Office.

Course Work

The School of Dance offers all course work designated DANC in the Courses chapter of this catalog.

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their major at the 300-level or above. Students in the BFA and BA in dance fulfill this requirement by successfully completing DANC 390 or 391.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Certification to Teach

This program is approved by the Virginia State Department of Education and administered through the College of Education and Human Development, which is accredited by the National Council for the Accreditation of Teacher Education (NCATE). To be considered for licensure in dance education, a student must successfully complete requirements for a BA or BFA in dance. In addition, students must meet the following requirements:

- Be formally accepted into the program by the Dance Education Committee. Before requesting an interview with the committee, students must complete 45 to 60 credits with a GPA of 2.80 or higher, and submit passing scores for the Praxis I tests (Reading, Writing, Mathematics). **It is strongly recommended that students take the Praxis I tests as soon as they have completed ENGH 302, a course in literature, and a course in mathematics.**
- Earn no grade lower than a C in dance (see major curriculum) and in professional education courses (EDUC 301, 302; EDRD 300; DANC 453, 454).
- Maintain an overall GPA of 2.80 or higher in all dance course work at Mason and at all other institutions of higher learning combined.
- As dance elective options, complete DANC 118 World Dance, DANC 453 Teaching Creative Movement, and DANC 131 Beginning Jazz Technique or 231 Intermediate Jazz Technique.
- With committee approval, register for and complete EDUC 301 and 302 and EDRD 300.
- After completing all required course work and with committee approval, submit passing scores on the VLCA and complete a full-time 15-week student teaching internship (DANC 455) that includes experiences at both elementary and middle or secondary levels.

This course of study will require a post-baccalaureate semester.
Degree Requirements

General Education (43 credits)

Foundation

Written Communication:

Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3

Foundation Requirements:

- Quantitative reasoning Credits: 3
- Information technology Credits: 3

Core Requirements

- Literature Credits: 3
- Natural science (must include one laboratory science) Credits: 7
- Western civilization Credits: 3
- Global understanding Credits: 3
- Social science Credits: 3
- Arts Credits: 9
  - AVT/ARTH Credits: 3
  - THR 210 - Acting I Credits: 3
  - Choose one of the following Credits: 3
    - MUSI 101 - Introduction to Classical Music
    - MUSI 102 - Popular Music in America
    - MUSI 103 - Musics of the World
    - MUSI 104 - Introduction to Twentieth-Century Music
    - MUSI 105 - Music in the United States

Synthesis

- DANC 490 - Senior Dance Seminar Credits: 3

Dance Major Core (80 credits)
• DANC 114 - Rhythmic Analysis and Music Resources for Dance Credits: 3
• DANC 150 - Dance Improvisation Credits: 3
• DANC 170 - Orientation to Dance Production Credits: 1
• DANC 190 - First Year Seminar Credits: 1
• DANC 210 - Dynamic Alignment Credits: 3
• DANC 251 - Dance Composition I Credits: 3
• DANC 252 - Dance Composition II Credits: 3
• DANC 270 - Dance Production Lab Credits: 1
• DANC 360 - Choreography Credits: 3
• DANC 362 - Directed Choreography Credits: 1
• 4 credits of DANC 370 - Dance Performance Credits: 0-1
• DANC 372 - Advanced Dance Production Credits: 1
• DANC 390 - Dance History I Credits: 3
• DANC 391 - Dance History II Credits: 3
• DANC 454 - Methods of Teaching Dance Credits: 3
• DANC 410 - Introduction to Contemporary Movement Theories Credits: 3 or DANC 480 - Introduction to Laban Movement Analysis Credits: 3

Choose 18 credits from the following:
• DANC 325 - Intermediate Modern Dance Credits: 1-3
• DANC 425 - Advanced Modern Dance Credits: 1-3

Choose 9 credits from the following:
• DANC 345 - Intermediate Ballet Credits: 1-3
• DANC 445 - Advanced Ballet Credits: 1-3

Dance Electives (14 credits)

Chosen from the following:
• DANC 118 - World Dance Credits: 3
• DANC 119 - Dance in Popular Culture: Afro-Latino Dance Credits: 3
• DANC 120 - Special Topics in Dance Credits: 1-3
• DANC 131 - Beginning Jazz Technique Credits: 3
• DANC 161 - Beginning Tap Dance Credits: 3
• DANC 225 - Beginning Intermediate Modern Dance Credits: 3
• DANC 231 - Intermediate Jazz Technique Credits: 3
• DANC 245 - Beginning Intermediate Ballet Credits: 3
• DANC 318 - Global Perspectives: World Dance Forms Credits: 3
• DANC 324 - Introduction to Dance Conditioning Credits: 1-3
• DANC 325 - Intermediate Modern Dance Credits: 1-3
• DANC 326 - Dance Performance Practicum Credits: 0-1
• DANC 331 - Advanced Jazz Dance Credits: 3
• DANC 345 - Intermediate Ballet Credits: 1-3
• DANC 362 - Directed Choreography Credits: 1
• DANC 370 - Dance Performance Credits: 0-1
• DANC 371 - Residency Workshop Credits: 0-1
• DANC 399 - Independent Study Credits: 1-3
• DANC 410 - Introduction to Contemporary Movement Theories Credits: 3
• DANC 418 - Global Dance Intensive Credits: 1-3
• DANC 420 - Special Topics in Dance Credits: 1-3
• DANC 425 - Advanced Modern Dance Credits: 1-3
• DANC 445 - Advanced Ballet Credits: 1-3
• DANC 453 - Teaching Creative Movement Credits: 3
• DANC 455 - Teaching Practicum Credits: 1-6

Note:
Additional technique and performance credits beyond those required in the major core may be applied to dance electives.

Electives

• Elective Credits: 3

Total: 126 credits

Undergraduate Minor

Dance Appreciation Minor

Banner Code: DNCA

Performing Arts Building, Room A300
Phone: 703-993-1114
Web: dance.gmu.edu

The minor (21 credits) offers students an opportunity to study a variety of movement styles and understand dance in its historical and cultural context. A maximum of 4 transfer credits may be applied to the dance minor.

University policy states that students must earn 8 distinct credits that are not used for their major toward their minor.

Course Work

To earn the minor, students must complete the following courses:

Core (6 credits):

• DANC 101 - Dance Appreciation Credits: 3
• DANC 118 - World Dance Credits: 3
Students must complete three of the following courses (9 credits):

- DANC 125 - Beginning Modern Dance Credits: 3
- DANC 145 - Beginning Ballet Credits: 3
- DANC 225 - Beginning Intermediate Modern Dance Credits: 3
- DANC 245 - Beginning Intermediate Ballet Credits: 3

Note:

Students with prior experience in ballet and/or modern dance may, with permission of instructor, take all 9 credits of technique courses at the 200 level.

All students pursuing the minor must demonstrate a basic level of training in both modern dance and ballet, and therefore, complete 9 credits of modern and ballet technique.

Students must choose two or more courses from the following (6 credits):

- DANC 118 - World Dance Credits: 3 *
- DANC 119 - Dance in Popular Culture: Afro-Latino Dance Credits: 3
- DANC 120 - Special Topics in Dance Credits: 1-3
- DANC 125 - Beginning Modern Dance Credits: 3
- DANC 131 - Beginning Jazz Technique Credits: 3
- DANC 145 - Beginning Ballet Credits: 3
- DANC 161 - Beginning Tap Dance Credits: 3
- DANC 225 - Beginning Intermediate Modern Dance Credits: 3
- DANC 231 - Intermediate Jazz Technique Credits: 3
- DANC 245 - Beginning Intermediate Ballet Credits: 3
- DANC 301 - What is Dance? Credits: 3
- DANC 318 - Global Perspectives: World Dance Forms Credits: 3
- DANC 331 - Advanced Jazz Dance Credits: 3
- DANC 418 - Global Dance Intensive Credits: 1-3
- DANC 420 - Special Topics in Dance Credits: 1-3

Total: 21 credits

Notes:

Substitutions may be proposed to department faculty for approval.

* DANC 118 fulfills the global understanding requirement. Students who choose to take this course twice for the minor must select two different world cultures.
Master's Degree

Dance, MFA

Banner Code: AR-MFA-DANC

Performing Arts Building, Room A300
Phone: 703-993-1114
Web: dance.gmu.edu

Faculty

Elizabeth Price, Director

Professors: Lepore, Miller, Shields

Associate Professors: Joyce, Price (director), Studd

Adjunct Faculty: Cronmiller, Summerall

Graduate Program

The MFA in dance is a highly selective 60 credit program of study grounded in the modern dance genre that emphasizes mastery in performance, choreography, and teaching in higher education. Applicants must have significant (5 years or more) professional performance experience in modern or ballet at the national or international level. They must also demonstrate professional competence in choreography as exemplified by a significant body of work, and have experience teaching technique at the advanced level.

Admission Requirements

In addition to fulfilling the admission requirements for graduate study, the applicant must submit directly to the School of Dance a résumé, artistic statement including artistic goals, and a 15-minute video of original choreography.

All candidates must satisfy the following prerequisites: advanced dance technique, improvisation, dance composition, history, anatomy/kinesiology, and dance production. Prerequisite courses are usually fulfilled if the applicant has earned a BA or BFA in dance.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Degree Requirements

- 3 credits of  DANC 501 - Graduate Dance Seminar Credits: 1-3
- DANC 510 - Contemporary Movement Theories Credits: 3 or  DANC 580 - Laban Movement Analysis Credits: 3
- 6 credits of  DANC 560 - Advanced Choreography Credits: 3
- DANC 562 - Directed Choreography Credits: 3
- 3 credits of DANC 570 - Advanced Dance Performance Credits: 1-3
- DANC 571 - Residency Workshop Credits: 3
- DANC 615 - Contemporary Trends Credits: 3
- DANC 627 - Advanced Teaching Seminar Credits: 3
- DANC 672 - Dance Production Credits: 3
- 3 credits of DANC 790 - Internship Credits: 1-3
- 6 credits of DANC 799 - Thesis Credits: 1-6

Choose 15 credits from the following:
- 9-12 credits of DANC 525 - Advanced Modern Dance Credits: 1-3
- 3-6 credits of DANC 545 - Advanced Ballet Credits: 1-3

Electives (6 credits)

Total: 60 credits

Note:

Mason does not guarantee the availability of these courses every semester; some are offered in alternate years.

Film and Video Studies

Performing Arts Building, Room A407
Phone: 703-993-5158
Web: gmu.edu/cvpa/favs

Faculty

Cynthia Lont, Program Director
Clayton Austin, Theater; Thomas Britt, Film and Video Studies; Julie Christensen, Modern and Classical Languages; Mark Cooley, Art and Visual Technology; Lynne Constantine, Art and Visual Technology; Ken Elston, Theater; Edgar Endress, Art and Visual Technology; Peggy Feerick, Art and Visual Technology; Cynthia Fuchs, English; Edward Gero, Theater; Timothy Gibson, Communication; Carma Hinton, Robinson Professor; Seth Hudson, Computer Game Design; Richard Kamenitzer, Arts Management; Howard Kurtz, Theater; Alison Landsberg, History and Art History; Carla Marcantonio, English; Scott Martin, Computer Game Design; Heather McDonald, Theater; David Miller, Communication; Kristina Olsen, Modern and Classical Languages; Paula Petrik, History and Art History; Janine Ricouart, Modern and Classical Languages; Mark Sample, English; Jessica Scarlata, English; Benjamin Steger, Film and Video Studies; Gail Scott White, Art and Visual Technology; Martin Winkler, Modern and Classical Languages; Sue Wrbican, Art and Visual Technology

Course Work

The Film and Video Studies Program offers all course work designated FAVS in the Courses chapter of this catalog.
Undergraduate Program

The Film and Video Studies Program offers a 120-credit multidisciplinary BA degree, which spans many units including Art and Visual Technology, Communication, English, History and Art History, Modern and Classical Languages, New Century College, and Theater. Students study film and video production, theory, criticism, ethics, screenwriting, and business.

The vocabulary of film (broadly defined) pervades the intellectual, cultural, political, and social landscape. The tools the filmmaker wields apply to an ever-widening range of tasks across the fields of human endeavor, from traditional narrative and documentary productions to academic research and pedagogical applications to projects of personal expression. Emerging technology makes the means of production available to anyone with access to a moderate level of computing power. This combination of factors makes film an important subject for academic inquiry and training.

Portfolio Requirement

All students are admitted to the Film and Video Studies (FAVS) program of study separately from their admission to the university and only by portfolio review. Admission to the university is determined by the Admissions Office.

New students at Mason may apply to the BA program upon admission to the university through a portfolio review. Information about the portfolio process, including dates and portfolio requirements, can be found on the FAVS web page, http://cvpa.gmu.edu/favs or by calling 703-993-5158. The portfolio must be submitted to favs@gmu.edu for assessment prior to scheduling an appointment for the portfolio review.

Writing-Intensive Requirement

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students seeking a BA in film and video studies fulfill this requirement by completing THR 482.

Upper-Level Credits

All undergraduate students are required to complete a minimum of 45 credits of upper-division courses at the 300-499 level.

Graduate Program affiliated with Film and Video Studies

The master's degree program in interdisciplinary studies with a concentration in Film and Video Studies (MAIS in Film and Video Studies) in the College of Humanities and Social Sciences is designed for students who seek a degree that integrates knowledge from several disciplines in the area of film/video. It addresses a rapidly evolving demand for specialized and individualized graduate study.

The degree requires course work with FAVS program and faculty and selected courses from other disciplines. Students complete their degree with a project or thesis. For additional information, please refer to the MAIS in Film and Video Studies in the catalog.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Undergraduate Degree
Film and Video Studies, BA

Banner Code: AR-BA-FAVS

Performing Arts Building, Room A407
Phone: 703-993-5158
Web: gmu.edu/cvpa/favs

Faculty

Cynthia Lont, Program Director
Clayton Austin, Theater; Thomas Britt, Film and Video Studies; Julie Christensen, Modern and Classical Languages; Mark Cooley, Art and Visual Technology; Lynne Constantine, Art and Visual Technology; Ken Elston, Theater; Edgar Endress, Art and Visual Technology; Peggy Feerick, Art and Visual Technology; Cynthia Fuchs, English; Edward Gero, Theater; Timothy Gibson, Communication; Carma Hinton, Robinson Professor; Seth Hudson, Computer Game Design; Richard Kamenitzer, Arts Management; Howard Kurtz, Theater; Alison Landsberg, History and Art History; Carla Marcantonio, English; Scott Martin, Computer Game Design; Heather McDonald, Theater; David Miller, Communication; Kristina Olsen, Modern and Classical Languages; Paula Petrik, History and Art History; Janine Ricouart, Modern and Classical Languages; Mark Sample, English; Jessica Scarlata, English; Benjamin Steger, Film and Video Studies; Gail Scott White, Art and Visual Technology; Martin Winkler, Modern and Classical Languages; Sue Wrbican, Art and Visual Technology

Course Work

The Film and Video Studies Program offers all course work designated FAVS in the Courses chapter of this catalog.

Program

The Film and Video Studies Program offers a 120-credit multidisciplinary BA degree, which spans many units including Art and Visual Technology, Communication, English, History and Art History, Modern and Classical Languages, New Century College, and Theater. Students study film and video production, theory, criticism, ethics, screenwriting, and business.

The vocabulary of film (broadly defined) pervades the intellectual, cultural, political, and social landscape. The tools the filmmaker wields apply to an ever-widening range of tasks across the fields of human endeavor, from traditional narrative and documentary productions to academic research and pedagogical applications to projects of personal expression. Emerging technology makes the means of production available to anyone with access to a moderate level of computing power. This combination of factors makes film an important subject for academic inquiry and training.

Portfolio Requirement

All students are admitted to the Film and Video Studies (FAVS) program of study separately from their admission to the university and only by portfolio review. Admission to the university is determined by the Admissions Office.

New students at Mason may apply to the BA program upon admission to the university through a portfolio review. Information about the portfolio process, including dates and portfolio requirements, can be found on the FAVS web page, http://cvpa.gmu.edu/favs or by calling 703-993-5158. The portfolio must be submitted to favs@gmu.edu for assessment prior to scheduling an appointment for the portfolio review.
**Writing-Intensive Requirement**

The university requires all students to complete at least one course designated “writing intensive” in their majors at the 300 level or above. Students seeking a BA in film and video studies fulfill this requirement by completing THR 482.

**Upper-Level Credits**

All undergraduate students are required to complete a minimum of 45 credits of upper-division courses at the 300-499 level.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Degree Requirements**

**General Education (40 credits)**

**Foundation Requirements**

- Oral communication Credits: 3
- Information technology Credits: 3
- Quantitative reasoning Credits: 3
- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as 302, to fulfill degree requirements.

**Core Requirements**

- Literature Credits: 3
- Arts Credits: 3
- Natural science (including one laboratory science) Credits: 7
- Western civilization Credits: 3
- Global understanding Credits: 3
- Social and behavioral sciences Credits: 3
- Synthesis requirement Credits: 3
- Foreign language, minor, double major or double degree (see College of Visual and Performing Arts for foreign language requirements)

**Notes:**

FAVS majors may not double-count courses toward both the FAVS major and university general education requirements.
Major (50 credits)

Film and Video Studies Core Requirements (29 credits)

Students must earn a minimum grade of C in all core courses

- AVT 204 - Visual Thinking Credits: 3
- COMM 355 - Video Principles and Practices Credits: 3
- COMM 454 - Free Speech and Ethics Credits: 3 or FAVS 352 - Ethics of Film and Video Credits: 3
- ENGH 319 - Popular Culture Credits: 3 (Film and Video Forms section only)
- FAVS 100 - Film and Video Studies Colloquium Credits: 1 (Must be taken for a total of 2 credits)
- FAVS 355 - Film Business Practices Credits: 3
- FAVS 450 - Internship in Film and Video Studies Credits: 3
- FAVS 498 - Creative Producing and Development Credits: 3
- FAVS 499 - Senior Project Credits: 3
- THR 482 - Advanced Screenplay Workshop Credits: 3

Analysis, History, Theory (6 credits)

Take 6 credits from the following:

- CHIN 320 - Contemporary Chinese Film Credits: 3
- COMM 365 - Gender, Race, and Class in the Media Credits: 3
- COMM 380 - Media Criticism Credits: 3
- COMM 399 - Special Topics in Communication Credits: 1-3 (Must be approved by Program Director)
- ENGH 202 - Texts and Contexts Credits: 3 (Must be approved by Program Director. Cannot also be used for general education.)
- ENGH 319 - Popular Culture Credits: 3 (Cannot be the same topic as required FAVS core course)
- ENGH 370 - Introduction to Documentary Credits: 3
- ENGH 372 - Introduction to Film Credits: 3
- ENGH 470 - Topics in Film/Media History Credits: 3
- ENGH 472 - Topics in Film/Media Theory Credits: 3
- ENGH 474 - Topics in Film/Media Studies Credits: 3
- FAVS 225 - The History of World Cinema Credits: 3
- FAVS 399 - Special Topics in Film and Video Studies Credits: 1-3 (Must be approved by Program Director)
- FREN 470 - French and Francophone Cinema Credits: 3
- HIST 389 - Topics in U.S. History Credits: 3 (Must be approved by Program Director)
- HIST 393 - Topics in Film and History Credits: 3
- JAPA 320 - Japanese Cinema Credits: 3
- MUSI 301 - Music in Motion Pictures Credits: 3
- NCLC 347 - Gender Representation in Popular Culture Credits: 3-6
- RUSS 470 - Topics in (Post) Soviet Film Credits: 3
- WMST 300 - Current Issues in Women and Gender Studies Credits: 1-6
- Or other courses as approved by Program Director
Concentration (15 credits)

Students choose one of the following concentrations:

- Business
- Screenwriting
- Video Production

▲ Concentration in Business (BUS)

- AMGT 405 - Seminar in Arts Management Credits: 3
- COMM 375 - Mass Communication Advertising and Promotions Credits: 3
- FAVS 399 - Special Topics in Film and Video Studies Credits: 1-3 (Special Topics in Film Business/Management Credits: 3)
- Select Elective Courses from the list below (6 credits):
  - AMGT 471 - Introduction to Grant Writing Credits: 1
  - COMM 320 - Business and Professional Communication Credits: 3
  - COMM 330 - Principles of Public Relations Credits: 3
  - COMM 359 - Media Management Credits: 3
  - FAVS 399 - Special Topics in Film and Video Studies Credits: 1-3 (Topic Focus in Business)
  - GAME 399 - Special Topics Credits: 1-4 (Topic Focus in Business)
  - MSOM 300 - Managing Financial Resources Credits: 3
  - MSOM 301 - Managing People and Organizations Credits: 3
  - MSOM 302 - Managing Information in a Global Environment Credits: 3
  - MSOM 303 - Marketing in a Global Economy Credits: 3
  - MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise Credits: 3
  - MSOM 305 - Managing in a Global Economy Credits: 3
  - MSOM 306 - Managing Projects and Operations Credits: 3
  - Or other courses as approved by Program Director

Note:

MSOM electives in concentration area may not also be used for MSOM minor.

▲ Concentration in Screenwriting (SCWR)

- ENGH 396 - Introduction to Creative Writing Credits: 3
- FAVS 483 - Feature-Length Scriptwriting Credits: 3
- GAME 332 - Story Design for Computer Games Credits: 3
- Select Elective Courses from the list below (6 credits)
  - COMM 303 - Writing across the Media Credits: 3
  - ENGH 377 - Digital Creative Writing Credits: 3
  - ENGH 386 - Editing for Audience, Style, and Voice Credits: 3
• ENGH 398 - Fiction Writing Credits: 3
• ENGH 399 - Creative Nonfiction Writing Credits: 3
• ENGH 492 - Advanced Fiction Writing Workshop Credits: 3
• ENGH 497 - Topics in Creative Writing Credits: 3
• FAVS 399 - Special Topics in Film and Video Studies Credits: 1-3 (Topic Focus in Screenwriting/Scriptwriting)
• GAME 399 - Special Topics Credits: 1-4 (Topic Focus in Screenwriting/Scriptwriting)
• THR 380 - Playwriting I Credits: 3
• THR 381 - Playwriting II Credits: 3
• THR 382 - Screenplay Workshop Credits: 3
• THR 480 - Advanced Playwriting Credits: 3
• Or other courses as approved by Program Director

▲ Concentration in Video Production (VPRO)

• COMM 360 - Video Editing Credits: 3
• FAVS 335 - Sound and Lighting for Film and Video Credits: 3
• FAVS 365 - Documentary Filmmaking I Credits: 3 or FAVS 399 - Special Topics in Film and Video Studies: Fiction Film Directing Credits: 3
• Select Elective Courses from the list below (6 credits)
• AVT 354 - Digital Photo Techniques Credits: 4
• AVT 356 - Fundamentals of Studio Lighting Credits: 4
• AVT 374 - Sound Art I Credits: 4
• AVT 382 - 2D Experimental Animation Credits: 4
• AVT 383 - 3D Experimental Animation Credits: 4
• AVT 390 - Video Art Credits: 4
• AVT 482 - Advanced Image Making Credits: 4
• AVT 487 - Advanced Topics: New Media Art Credits: 4
• COMM 358 - Video Producing and Directing Credits: 3
• COMM 364 - Videography Credits: 3
• COMM 366 - Visual Communication Credits: 3
• COMM 399 - Special Topics in Communication Credits: 1-3 (Topic Focus in Production)
• FAVS 365 - Documentary Filmmaking I Credits: 3 (Cannot be taken if used as required concentration course)
• FAVS 399 - Special Topics in Film and Video Studies Credits: 3 (Topic Focus in Production)
• FAVS 460 - Advanced Video Editing Credits: 3
• THR 423 - Audition Techniques: Stage and Camera Credits: 3
• Or other courses as approved by Program Director

General Electives (30)

Students must use general electives to complete a minor, double major or second degree outside the major field of study, or demonstrate intermediate-level proficiency in one foreign language.

Total: 120 credits
School of Music

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

Faculty

Dennis Layendecker, Heritage Chair, Director

Professors: Camphouse, Carroll, Engebretson, Gardner, Layendecker (director), Maiello, Miller, Monson (associate director), Smith

Term Professors: Balakerskaia, Hearden, Rendler

Associate Professors: Aler, R. Bergman, Billingham, T. Owens

Term Associate Professor: Ker-Hackleman

Assistant Professors: Guessford, Nickens, Robinson

Term Associate Professor: Wuttke

Term Assistant Professor: Kilkenny


Course Work

The School of Music offers all course work designated MUSI in the Courses chapter of this catalog.

Undergraduate Programs

The two undergraduate degree programs offered through the School of Music, the bachelor of art (BA) in music and the bachelor of music (BM), prepare students for graduate work in music and music literature; research and professional work in musical activities; and state licensure, or certification, to teach vocal and choral or instrumental music at the elementary and secondary school levels.

Through its strategic plan, Music Outreach and the Teaching Professions, the School of Music enables students to pursue worthwhile vocational goals as teachers, performers, conductors, and composers. The School of Music also seeks to educate its students to reflect a concern for cultural and humanistic values as future ambassadors and advocates of music and other arts. Through innovative learning experiences, the School of Music provides all students in the BA and BM programs with opportunities to become effective musicians, teachers, and advocates of music. Teaching music is the principal area in which students can find employment in private studios, public and private schools, academies, and higher education within the ever-changing workplace. Because of this, all music majors at Mason receive some training in the teaching of music.
The School of Music also recognizes the critical outreach role it provides in serving students from all majors, as well as members of the community who significantly benefit from the values and experiences of an education in music. The School of Music seeks to provide unique educational opportunities through its various course offerings, workshops, presentations, and performances for those seeking music enrichment.

**Entrance to all music degree programs is by audition. Arrangements for an audition must be made in advance by contacting the School of Music before the scheduled audition date.** Auditions are held approximately once per month. Audition dates and audition application forms are available through the School of Music web site: music.gmu.edu.

A fundamentals of music test is given during the first week of classes to all students enrolled in MUSI 115 Theory I. Call the School of Music at 703-993-1380 for additional information.

Competency placement tests are required of all transfer students who wish to present transfer credit in any of the following areas: aural skills and keyboard skills.

Students must earn a minimum 2.00 cumulative GPA in their major or higher, if required by their program.

**Writing-Intensive Requirement**

Mason requires all students to complete at least one course designated “writing intensive” in their major at the 300 level or above. Students majoring in music may fulfill this requirement by successfully completing MUSI 332. Students who transfer this course into Mason may be required to repeat it or enroll in some other suitable course to fulfill the writing intensive requirement.

**Teacher Licensure**

Undergraduate students seeking certification to teach vocal and choral or instrumental music at the elementary and secondary levels must earn the BM degree as specified under Concentration in Music Education section in this chapter. Students who have earned a baccalaureate degree and are seeking state licensure to teach music must also complete this sequence of courses, which constitute a state-approved program for teacher education in music.

**Graduate Certificates**

**Instrumental Performance Artist Graduate Certificate**

The certificate is a specialized, graduate-level program for advanced musicians who desire to further develop and refine their performance art. The certificate program is a two-year course of study requiring at least two consecutive semesters of residence. A total of 32 credits is required. Advisor's approval is required for each semester's enrollment.

**Piano Performance Artist Certificate**

The certificate is a specialized, graduate-level program for advanced musicians who desire to further develop and refine their performance art. The certificate program is a two-year course of study requiring at least two consecutive semesters of residence. A total of 32 credits is required. Advisor's approval is required for each semester's enrollment.

**Vocal Performance Artist Graduate Certificate**

The certificate is a specialized, graduate-level program for advanced musicians who desire to further develop and refine their performance art. The certificate program is a two-year course of study requiring at least two consecutive semesters of residence. A total of 32 credits is required. Advisor's approval is required for each semester's enrollment.
Graduate Programs

The PhD in music education and the doctor of musical arts degree require 60 credits beyond the master’s degree in music.

Music, MM

The expansion of professional education in the arts is paramount for the growth and development of a rich and vital cultural community and a supporting network of individual artists. The dynamics of contemporary society suggest that the influence of the arts on public life will continue to expand well into the 21st century. Each year, opportunities increase for creative work by performers, composers, sculptors, painters, dancers, actors, historians, theoreticians, and musicologists.

The MM degree is offered as an educational channel to meet the intellectual and career needs of qualified students. It is a comprehensive and advanced program of study with a choice of concentrations in performance, music education, composition, conducting, jazz studies, and pedagogy. The MM with a concentration in music education does not provide licensure to teach music in public or private schools.

PhD in Music Education

The PhD in music education, a research-intensive degree, focuses on the gathering, processing, and interpretation of information. Students in the PhD program take seminars and topics courses in music education, as well as research courses through the College of Education and Human Development. PhD graduates are expected to demonstrate the ability to communicate significant concepts of music education.

Doctor of Music Arts

The doctor of musical arts concentrations are composition, conducting, and performance. While these concentrations share some of the required course work, each is also distinct in course requirements. Professional musicians earn the DMA to enhance and extend their knowledge and practice within their area of specialization. The DMA student focuses on the profession of music performance, as well as the theory and practice of the discipline.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

Undergraduate Degree

Music, BA

Banner Code: AR-BA-MUSI

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu
Faculty

Dennis Layendecker, Heritage Chair, Director

Professors: Camphouse, Carroll, Engebretson, Gardner, Layendecker (director), Maiello, Miller, Monson (associate director), Smith

Term Professors: Balakerskaia, Hearden, Rendler

Associate Professors: Aler, R. Bergman, Billingham, T. Owens

Term Associate Professor: Ker-Hackleman

Assistant Professors: Guessford, Nickens, Robinson

Term Associate Professor: Wuttke

Term Assistant Professor: Kilkenny


The bachelor of art (BA) in music prepares students for graduate work in music and music literature as well as research and professional work in musical activities.

Entrance to all music degree programs is by audition. Arrangements for an audition must be made in advance by contacting the School of Music before the scheduled audition date. Auditions are held approximately once per month. Audition dates and audition application forms are available through the School of Music web site: music.gmu.edu.

A fundamentals of music test is given during the first week of classes to all students enrolled in MUSI 115 Theory I. Call the School of Music at 703-993-1380 for additional information.

Competency placement tests are required of all transfer students who wish to present transfer credit in any of the following areas: aural skills and keyboard skills.

Students must earn a minimum 2.00 cumulative GPA in their major or higher, if required by their program.

Students pursuing a BA must complete the general education program outlined below. This distribution enables students to develop a breadth of knowledge, as well as the necessary skills to make the in-depth study of a major truly meaningful. In addition to general education requirements, students must also demonstrate intermediate-level proficiency in one foreign language or complete a minor program. A minimum of 57 credits in music course work is required for the music major. A total of 120 credits is required.

Writing-Intensive Requirement

Mason requires all students to complete at least one course designated “writing intensive” in their major at the 300 level or above. Students majoring in music may fulfill this requirement by successfully completing MUSI 332. Students who transfer this course into Mason may be required to repeat it or enroll in some other suitable course to fulfill the writing intensive requirement.

Academic Policies
Degree Requirements

General Education (25-46 credits)

Foundation Requirements

- Quantitative reasoning (mathematics) Credits: 3
- ENGH 101 - Composition Credits: 3 *
- ENGH 302 - Advanced Composition Credits: 3
*Nonnative speakers of English with limited proficiency may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.

Core Requirements

- Literature Credits: 3*
- Natural science (two classes; one must contain a lab) Credits: 7*
- Western civilization Credits: 3
- Social or behavioral science Credits: 3*

Notes:

* Also have significant elective choices as per general education listing.

Remaining general education requirements are fulfilled with major course work.

Other (0-21 credits)

- Intermediate-level language proficiency*, or an academic minor, double major or double degree outside the major field of study

Note:

* See beginning of CVPA chapter for foreign language requirement.

Music Major (57-58 credits)

Musicianship (19 credits)
• MUSI 115 - Theory I Credits: 3  
• MUSI 116 - Theory II Credits: 3  
• MUSI 215 - Theory III Credits: 3  
• MUSI 216 - Theory IV Credits: 3  
• MUSI 113 - Aural Skills I Credits: 1  
• MUSI 114 - Aural Skills II Credits: 1  
• MUSI 213 - Aural Skills III Credits: 2  
• MUSI 171 - Keyboard Skills I Credits: 1 (Pianists substitute MUSI 371 for MUSI 171)  
• MUSI 172 - Keyboard Skills II Credits: 1 (Pianists substitute MUSI 372 for MUSI 172)  
• MUSI 273 - Keyboard Skills III Credits: 1

Music History Courses (12 credits)

• MUSI 331 - Music History in Society I Credits: 3  
• MUSI 332 - Music History in Society II Credits: 3  
• MUSI 431 - Music History in Society III Credits: 3 (Meets general education global understanding requirement)  
• MUSI 432 - Music History in Society IV Credits: 3

Performance and Music Electives (24 credits)

• Applied music Credits: 8  
• Large ensemble (Transfer students must earn at least 2 credits at Mason) Credits: 4  
• Additional ensembles (Large or small; meets university general education arts requirement) Credits: 3  
• MUSI 415 - Music in Computer Technology Credits: 3 (Meets university general education information technology requirement)  
• MUSI 251 - The Art of Teaching Music Credits: 3 (Meets university general education communication requirement)  
• MUSI 490 - Musical Communication in Context Credits: 3 (Meets university general education synthesis requirement)  
• MUSI 300 - Recital Attendance Credits: 0 (five semesters)

Pedagogy (Students must register for instrumental pedagogy and literature class appropriate to major instrument or teaching internship) (2-3 credits)

• MUSI 351 - Keyboard Pedagogy Credits: 3 (Required for students whose major instrument is Keyboard)  
• MUSI 352 - Vocal Pedagogy and Lab Credits: 3 (Required for students whose major instrument is vocal)  
• MUSI 353 - Instrumental Pedagogy and Literature Credits: 3 Orchestral Strings (required for students whose major instrument is Strings)  
• MUSI 353 - Instrumental Pedagogy and Literature: Guitar Credits: 3 (Required for students whose major instrument is Guitar)  
• MUSI 353 - Instrumental Pedagogy and Literature Winds, Brass, Percussion Credits: 3 (Recommended but not required for students whose major instrument is Wind, Brass or Percussion) 
• 2 credits* of MUSI 395 - Teaching Internship Credits: 1-4
*except MUSI 395: Wind, Brass, and Percussion who have the option to sign up for 4 credits, to be divided over 2 semesters

General Electives (20-38 credits)

Can include additional music courses.

Total: 120 credits

Music, BM

Banner Code: AR-BM-MUSI

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

Faculty

Dennis Layendecker, Heritage Chair, Director

Professors: Camphouse, Carroll, Engebretson, Gardner, Layendecker (director), Maiello, Miller, Monson (associate director), Smith

Term Professors: Balakerskaia, Hearden, Rendler

Associate Professors: Aler, R. Bergman, Billingham, T. Owens

Term Associate Professor: Ker-Hackleman

Assistant Professors: Guessford, Nickens, Robinson

Term Associate Professor: Wuttke

Term Assistant Professor: Kilkenny


The bachelor of music (BM) prepares students for graduate work in music and music literature; research and professional work in musical activities; and state licensure, or certification, to teach vocal and choral or instrumental music at the elementary and secondary school levels.

Entrance to all music degree programs is by audition. Arrangements for an audition must be made in advance by contacting the School of Music before the scheduled audition date.
Auditions are held approximately once per month. Audition dates and audition application forms are available through the School of Music web site: music.gmu.edu

A fundamentals of music test is given during the first week of classes to all students enrolled in MUSI 115 Theory I. Call the School of Music at 703-993-1380 for additional information.

Competency placement tests are required of all transfer students who wish to present transfer credit in any of the following areas: aural skills and keyboard skills.

120 credits are required for the BM degree. Four concentrations are offered: composition, jazz, music education, and performance. Students are required to complete core courses in one of the concentrations plus courses listed below in one of the points of emphasis relative to the concentration. Eligibility to continue in upper-level courses will be assessed during the sophomore year of study.

Students must earn a minimum 2.00 cumulative GPA in their major or higher, if required by their program.

**Writing-Intensive Requirement**

Mason requires all students to complete at least one course designated “writing intensive” in their major at the 300 level or above. Students majoring in music may fulfill this requirement by successfully completing MUSI 332. Students who transfer this course into Mason may be required to repeat it or enroll in some other suitable course to fulfill the writing intensive requirement.

**Teacher Licensure**

Undergraduate students seeking certification to teach vocal and choral or instrumental music at the elementary and secondary levels must earn the BM degree as specified under Concentration in Music Education section in this chapter. Students who have earned a baccalaureate degree and are seeking state licensure to teach music must also complete this sequence of courses, which constitute a state-approved program for teacher education in music.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Degree Requirements**

**General Education (21 credits)**

Coursework within the major and concentration fulfills the information technology, global understanding, oral communications, fine arts, and synthesis general education requirements. Students should consult the university general education guidelines for course options that fulfill the requirements remaining in the following areas:

- 3 credits of quantitative reasoning
- 6 credits of written communication
- 3 credits of literature
- 3 credits of non-lab natural science
- 3 credits of western civilization
- 3 credits of social or behavioral science
Concentrations

Students may choose from one of the following concentrations:

- Composition
- Jazz
- Music Education
- Performance

Core Courses Required for All Concentrations (40 Credits)

- MUSI 113 - Aural Skills I Credits: 1
- MUSI 114 - Aural Skills II Credits: 1
- MUSI 115 - Theory I Credits: 3
- MUSI 116 - Theory II Credits: 3
- MUSI 213 - Aural Skills III Credits: 2
- MUSI 214 - Aural Skills IV Credits: 2
- MUSI 215 - Theory III Credits: 3
- MUSI 216 - Theory IV Credits: 3
- MUSI 251 - The Art of Teaching Music Credits: 3 (general education oral communication)
- MUSI 273 - Keyboard Skills III Credits: 1
- MUSI 300 - Recital Attendance Credits: 0 (To be repeated five times)
- MUSI 319 - Class Composition and Arranging Credits: 3
- MUSI 331 - Music History in Society I Credits: 3
- MUSI 332 - Music History in Society II Credits: 3
- MUSI 415 - Music in Computer Technology Credits: 3 (general education information technology)
- MUSI 431 - Music History in Society III Credits: 3 (general education global understanding)
- MUSI 432 - Music History in Society IV Credits: 3

▲ Concentration in Composition (CPO):

Students must complete all concentration requirements as well as requirements for one of the following emphases:

- Brass
- Guitar
- Keyboard
- Percussion
- String
- Voice
- Woodwind

Courses Required for All Emphases (50 credits)
- 8 credits of MUSI 24X (see music advisor for permission and course options)
- MUSI 324 - Junior Recital Credits: 1
- MUSI 361 - Class Strings: Violin, Viola, Cello, and Bass Credits: 1
- MUSI 363 - Class Woodwinds: Flute, Clarinet , Saxophone Credits: 1 or MUSI 364 - Class Woodwinds: Oboe and Bassoon Credits: 1
- MUSI 365 - Class Brass: Trumpet and French Horn Credits: 1 or MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba Credits: 1
- MUSI 366 - Class Percussion Credits: 1
- MUSI 379 - Introduction to Jazz Improvisation Credits: 1
- MUSI 391 - Conducting I Credits: 2
- MUSI 396 - Conducting II Credits: 2
- MUSI 419 - Orchestration Credits: 3
- MUSI 424 - Senior Recital Credits: 1
- 12 credits of MUSI 44X (see music advisor for permission and course options)
- 3 credits of MUSI 454 - Jazz Arranging Credits: 3 or MUSI 485 - Chamber Ensembles Credits: 1
- 4 credits of MUSI 485 - Chamber Ensembles Credits: 1 (M3E or Healing Arts Ensemble only)
- MUSI 491 - Musical Communication in Performance Credits: 1 (general education synthesis)
- 8 credits of general MUSI electives

Emphasis Requirement (9 credits)

Composition: Brass emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
  Choose 4 credits from the following:
  - MUSI 380 - Wind Symphony Credits: 1
  - MUSI 383 - Symphonic Band Credits: 1
  - MUSI 387 - Symphony Orchestra Credits: 1
  - MUSI 389 - Jazz Ensemble Credits: 1

Composition: Guitar emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
  Choose 4 credits from the following:
  - MUSI 381 - University Chorale Credits: 1
  - MUSI 384 - Symphonic Chorus Credits: 1
  - MUSI 385 - Chamber Singers Credits: 1
  - MUSI 389 - Jazz Ensemble Credits: 1
Composition: Keyboard emphasis

- MUSI 351 - Keyboard Pedagogy Credits: 3
- MUSI 371 - Techniques of Accompanying I Credits: 1
- MUSI 372 - Techniques of Accompanying II Credits: 1

Choose 4 credits from the following:
- MUSI 381 - University Chorale Credits: 1
- MUSI 384 - Symphonic Chorus Credits: 1
- MUSI 385 - Chamber Singers Credits: 1

Composition: Percussion emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 353 - Instrumental Pedagogy and Literature Credits: 3

Choose 4 credits from the following:
- MUSI 380 - Wind Symphony Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Composition: String emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
- 4 credits of MUSI 387 - Symphony Orchestra Credits: 1

Composition: Voice emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 352 - Vocal Pedagogy and Lab Credits: 3

Choose 4 credits from the following:
- MUSI 381 - University Chorale Credits: 1
- MUSI 384 - Symphonic Chorus Credits: 1
- MUSI 385 - Chamber Singers Credits: 1
Composition: Woodwind emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 353 - Instrumental Pedagogy and Literature Credits: 3

Choose 4 credits from the following:
- MUSI 380 - Wind Symphony Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Total: 120 credits

▲ Concentration in Jazz (JAZC):

Students must complete all concentration requirements as well as requirements for one of the following emphases:

- Brass
- Guitar
- Keyboard
- Percussion
- Woodwind

Courses Required for All Emphases (49 credits)

- MUSI 107 - The Development of Jazz Credits: 3
- 8 credits of MUSI 24X (see music advisor for permission and course options)
- MUSI 311 - Jazz Studies Credits: 3
- MUSI 324 - Junior Recital Credits: 1
- MUSI 379 - Introduction to Jazz Improvisation Credits: 1
- MUSI 391 - Conducting I Credits: 2
- MUSI 424 - Senior Recital Credits: 1
- 12 credits of MUSI 44X (see music advisor for permission and course options)
- MUSI 450 - Jazz Improvisation I Credits: 2
- MUSI 452 - Jazz Improvisation II Credits: 2
- MUSI 454 - Jazz Arranging Credits: 3
- 6 credits of MUSI 485 - Chamber Ensembles Credits: 1 (Jazz Chamber Ensembles only)
- MUSI 491 - Musical Communication in Performance Credits: 1 (general education synthesis)
- 3 credits of MUSI 492J - Selected Topics in Music Credits: 1-3 (Topics in Jazz Studies only)
- 1 credit of general MUSI electives

Emphasis Requirement (10 credits)
Jazz: Brass emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
Choose 8 credits from the following:
- MUSI 380 - Wind Symphony Credits: 1
- MUSI 381 - University Chorale Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 384 - Symphonic Chorus Credits: 1
- MUSI 385 - Chamber Singers Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Jazz: Guitar emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
Choose 8 credits from the following:
- MUSI 380 - Wind Symphony Credits: 1
- MUSI 381 - University Chorale Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 384 - Symphonic Chorus Credits: 1
- MUSI 385 - Chamber Singers Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Jazz: Keyboard emphasis

- MUSI 371 - Techniques of Accompanying I Credits: 1
- MUSI 372 - Techniques of Accompanying II Credits: 1
Choose 8 credits from the following:
- MUSI 380 - Wind Symphony Credits: 1
- MUSI 381 - University Chorale Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 384 - Symphonic Chorus Credits: 1
- MUSI 385 - Chamber Singers Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Jazz: Percussion emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
Choose 8 credits from the following:
- MUSI 380 - Wind Symphony Credits: 1
- MUSI 381 - University Chorale Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 384 - Symphonic Chorus Credits: 1
- MUSI 385 - Chamber Singers Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Jazz: Woodwind emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1

Choose 8 credits from the following:
- MUSI 380 - Wind Symphony Credits: 1
- MUSI 381 - University Chorale Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 384 - Symphonic Chorus Credits: 1
- MUSI 385 - Chamber Singers Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Total: 120 credits

▲ Concentration in Music Education (MUE):

Certification to Teach

The music education concentration is approved by the Virginia State Department of Education and administered through the College of Education and Human Development, which is accredited by the National Council for the Accreditation of Teacher Education (NCATE). Minimum scores on the Praxis I and II and VCLA tests must be achieved before state licensure is granted.

Students normally are accepted into the music education concentration by the school’s Music Teacher Education Committee during the fourth semester of study, via interview and evaluation of academic transcript. They must have earned 45 to 60 credits and completed Aural Skills III, Keyboard Skills III, and Theory III with a grade of C or higher. Other requirements are as follows:

- Submit scores for the Praxis I (Reading, Writing, and Mathematics) tests to the committee. It is strongly recommended that students take the Praxis I tests as soon as they have completed ENGH 302, a course in literature, and a course in mathematics.
- Maintain an overall GPA of 2.80 in all course work completed at Mason and in course work at all institutions of higher learning combined.
- Earn no grade lower than a C in music and professional education courses needed for graduation.
• Successfully pass aural skills, keyboard, and conducting proficiency exams during the first music methods course (MUSI 461, 463, 464, 466, or 467). Students in the voice emphasis must also pass a voice proficiency exam, and students in the instrumental emphasis must pass a musical instrument fingering proficiency exam during the first music methods course.

• Complete all course work in the program sequence.

On fulfilling the above requirements, students must complete 15 weeks of a full-time student teaching internship. Applications for placement, subject to approval of the committee, are submitted to the Office of Teacher Education at the beginning of the previous semester. In addition, students must pass the VCLA before student teaching and the Praxis II (Music: Content Knowledge) test during the internship semester.

Students must complete all concentration requirements as well as requirements for one of the following emphases:

• Brass
• Guitar
• Keyboard
• Percussion
• String
• Voice
• Woodwind

Courses Required for All Emphases (34 credits)

• 8 credits of MUSI 24X (see music advisor for permission and course options)
• MUSI 323 - Music Education Recital Credits: 0
• MUSI 361 - Class Strings: Violin, Viola, Cello, and Bass Credits: 1
• MUSI 366 - Class Percussion Credits: 1
• MUSI 367 - Class Guitar Credits: 1
• MUSI 393 - Music Administration and Management Credits: 2
• 6 credits of MUSI 44X (see music advisor for permission and course options)
• 6 credits of MUSI 495 - Internship in Music Education: Student Teaching Credits: 6-12 (general education synthesis)
• EDRD 300 - Literacy and Curriculum Integration Credits: 3
• EDUC 301 - Educationally Diverse Populations: Handicapped, Gifted, Multicultural Credits: 3
• EDUC 302 - Human Growth and Development Credits: 3 or EDUC 539 - Human Development and Learning PK-12 Credits: 3

Emphasis Requirement (25 credits)

Music Education: Brass emphasis

• MUSI 171 - Keyboard Skills I Credits: 1
• MUSI 172 - Keyboard Skills II Credits: 1
• MUSI 363 - Class Woodwinds: Flute, Clarinet, Saxophone Credits: 1
• MUSI 364 - Class Woodwinds: Oboe and Bassoon Credits: 1
MUSI 365 - Class Brass: Trumpet and French Horn Credits: 1
MUSI 368 - Class Voice Credits: 1
MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba Credits: 1
MUSI 391 - Conducting I Credits: 2
MUSI 396 - Conducting II Credits: 2
MUSI 464 - Instrumental Music Methods I Credits: 3
MUSI 466 - Instrumental Music Methods II Credits: 3
1 credit of general MUSI electives

Choose 7 credits from the following:
MUSI 380 - Wind Symphony Credits: 1
MUSI 383 - Symphonic Band Credits: 1
MUSI 387 - Symphony Orchestra Credits: 1
MUSI 389 - Jazz Ensemble Credits: 1

Music Education: Guitar emphasis

MUSI 171 - Keyboard Skills I Credits: 1
MUSI 172 - Keyboard Skills II Credits: 1
MUSI 363 - Class Woodwinds: Flute, Clarinet, Saxophone Credits: 1
MUSI 364 - Class Woodwinds: Oboe and Bassoon Credits: 1
MUSI 365 - Class Brass: Trumpet and French Horn Credits: 1
MUSI 368 - Class Voice Credits: 1
MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba Credits: 1
MUSI 391 - Conducting I Credits: 2
MUSI 396 - Conducting II Credits: 2
MUSI 464 - Instrumental Music Methods I Credits: 3 or MUSI 467 - Instrumental Music Methods I: Orchestra Credits: 3
1 credit of general MUSI electives Credits: 1
MUSI 466 - Instrumental Music Methods II Credits: 3

Choose 7 credits from the following:
MUSI 381 - University Chorale Credits: 1
MUSI 384 - Symphonic Chorus Credits: 1
MUSI 385 - Chamber Singers Credits: 1
MUSI 389 - Jazz Ensemble Credits: 1

Music Education: Keyboard emphasis

2 credits of MUSI 223 - Applied Music in Voice Credits: 1
MUSI 352 - Vocal Pedagogy and Lab Credits: 3
MUSI 371 - Techniques of Accompanying I Credits: 1
MUSI 372 - Techniques of Accompanying II Credits: 1
MUSI 391 - Conducting I Credits: 2
MUSI 396 - Conducting II Credits: 2
• MUSI 461 - The Teaching of General Music in the Elementary and Middle School Credits: 3  
• MUSI 463 - The Teaching of Vocal Music in the Secondary School Credits: 3  
Choose 1 credit from the following:
• MUSI 363 - Class Woodwinds: Flute, Clarinet, Saxophone Credits: 1  
• MUSI 364 - Class Woodwinds: Oboe and Bassoon Credits: 1  
• MUSI 365 - Class Brass: Trumpet and French Horn Credits: 1  
• MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba Credits: 1  
Choose 7 credits from the following:
• MUSI 381 - University Chorale Credits: 1  
• MUSI 384 - Symphonic Chorus Credits: 1  
• MUSI 385 - Chamber Singers Credits: 1  

Music Education: Percussion emphasis

• MUSI 171 - Keyboard Skills I Credits: 1  
• MUSI 172 - Keyboard Skills II Credits: 1  
• MUSI 363 - Class Woodwinds: Flute, Clarinet, Saxophone Credits: 1  
• MUSI 364 - Class Woodwinds: Oboe and Bassoon Credits: 1  
• MUSI 365 - Class Brass: Trumpet and French Horn Credits: 1  
• MUSI 368 - Class Voice Credits: 1  
• MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba Credits: 1  
• MUSI 391 - Conducting I Credits: 2  
• MUSI 396 - Conducting II Credits: 2  
• MUSI 464 - Instrumental Music Methods I Credits: 3  
• MUSI 466 - Instrumental Music Methods II Credits: 3  
• 1 credit of general MUSI electives  
Choose 7 credits from the following:
• MUSI 380 - Wind Symphony Credits: 1  
• MUSI 383 - Symphonic Band Credits: 1  
• MUSI 387 - Symphony Orchestra Credits: 1  
• MUSI 389 - Jazz Ensemble Credits: 1  

Music Education: String emphasis

• MUSI 171 - Keyboard Skills I Credits: 1  
• MUSI 172 - Keyboard Skills II Credits: 1  
• MUSI 363 - Class Woodwinds: Flute, Clarinet, Saxophone Credits: 1  
• MUSI 364 - Class Woodwinds: Oboe and Bassoon Credits: 1  
• MUSI 365 - Class Brass: Trumpet and French Horn Credits: 1  
• MUSI 368 - Class Voice Credits: 1  
• MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba Credits: 1  
• 7 credits of MUSI 387 - Symphony Orchestra Credits: 1  
• MUSI 391 - Conducting I Credits: 2
- MUSI 396 - Conducting II Credits: 2
- MUSI 466 - Instrumental Music Methods II Credits: 3
- MUSI 467 - Instrumental Music Methods I: Orchestra Credits: 3
- 1 credit of general MUSI electives

Music Education: Voice emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- 2 credits of MUSI 222 - Applied Music in Keyboard Credits: 1
- MUSI 352 - Vocal Pedagogy and Lab Credits: 3
- MUSI 391 - Conducting I Credits: 2
- MUSI 396 - Conducting II Credits: 2
- MUSI 461 - The Teaching of General Music in the Elementary and Middle School Credits: 3
- MUSI 463 - The Teaching of Vocal Music in the Secondary School Credits: 3
  Choose 1 credit from the following:
  - MUSI 363 - Class Woodwinds: Flute, Clarinet, Saxophone Credits: 1
  - MUSI 364 - Class Woodwinds: Oboe and Bassoon Credits: 1
  - MUSI 365 - Class Brass: Trumpet and French Horn Credits: 1
  - MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba Credits: 1
  Choose 7 credits from the following:
  - MUSI 381 - University Chorale Credits: 1
  - MUSI 384 - Symphonic Chorus Credits: 1
  - MUSI 385 - Chamber Singers Credits: 1

Music Education: Woodwind emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 363 - Class Woodwinds: Flute, Clarinet, Saxophone Credits: 1
- MUSI 364 - Class Woodwinds: Oboe and Bassoon Credits: 1
- MUSI 365 - Class Brass: Trumpet and French Horn Credits: 1
- MUSI 368 - Class Voice Credits: 1
- MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba Credits: 1
- MUSI 391 - Conducting I Credits: 2
- MUSI 396 - Conducting II Credits: 2
- MUSI 464 - Instrumental Music Methods I Credits: 3
- MUSI 466 - Instrumental Music Methods II Credits: 3
- 1 credit of general MUSI electives
  Choose 7 credits from the following:
- MUSI 380 - Wind Symphony Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Total: 120 credits

▲ Concentration in Performance (PFM):

Students must complete all concentration requirements as well as requirements for one of the following emphases:

- Brass
- Guitar
- Keyboard
- Percussion
- String
- Voice
- Woodwind

Courses Required for All Emphases (23 credits)

- 8 credits of MUSI 24X (see music advisor for permission and course options)
- MUSI 324 - Junior Recital Credits: 1
- MUSI 424 - Senior Recital Credits: 1
- 12 credits of MUSI 44X (see music advisor for permission and course options)
- MUSI 491 - Musical Communication in Performance Credits: 1 (general education synthesis)

Emphasis Requirement (36 credits)

Performance: Brass emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
- MUSI 379 - Introduction to Jazz Improvisation Credits: 1
- MUSI 391 - Conducting I Credits: 2
- 4 credits of MUSI 395 - Teaching Internship Credits: 1-4
- MUSI 396 - Conducting II Credits: 2
- MUSI 419 - Orchestration Credits: 3
• 11 credits of general MUSI electives
  **Choose 8 credits from the following:**
  • MUSI 380 - Wind Symphony Credits: 1
  • MUSI 383 - Symphonic Band Credits: 1
  • MUSI 387 - Symphony Orchestra Credits: 1
  • MUSI 389 - Jazz Ensemble Credits: 1

**Performance: Guitar emphasis**

• MUSI 171 - Keyboard Skills I Credits: 1
• MUSI 172 - Keyboard Skills II Credits: 1
• MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
• MUSI 379 - Introduction to Jazz Improvisation Credits: 1
• MUSI 391 - Conducting I Credits: 2
• 4 credits of MUSI 395 - Teaching Internship Credits: 1-4
• MUSI 396 - Conducting II Credits: 2
• MUSI 419 - Orchestration Credits: 3
• 11 credits of general MUSI electives
  **Choose 8 credits from the following:**
  • MUSI 381 - University Chorale Credits: 1
  • MUSI 384 - Symphonic Chorus Credits: 1
  • MUSI 385 - Chamber Singers Credits: 1
  • MUSI 389 - Jazz Ensemble Credits: 1

**Performance: Keyboard emphasis**

• MUSI 351 - Keyboard Pedagogy Credits: 3
• MUSI 371 - Techniques of Accompanying I Credits: 1
• MUSI 372 - Techniques of Accompanying II Credits: 1
• MUSI 373 - Advanced Accompanying and Musicianship Skills Credits: 3
• MUSI 379 - Introduction to Jazz Improvisation Credits: 1
• MUSI 382 - Piano Ensemble Credits: 1 or MUSI 485 - Chamber Ensembles Credits: 1
• MUSI 391 - Conducting I Credits: 2
• 2 credits of MUSI 395 - Teaching Internship Credits: 1-4
• 3 credits of MUSI 492H - Selected Topics in Music Credits: 1-3
• 11 credits of general MUSI electives
  **Choose 8 credits from the following:**
  • MUSI 381 - University Chorale Credits: 1
  • MUSI 384 - Symphonic Chorus Credits: 1
  • MUSI 385 - Chamber Singers Credits: 1

**Performance: Percussion emphasis**
MUSI 171 - Keyboard Skills I Credits: 1
MUSI 172 - Keyboard Skills II Credits: 1
MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
MUSI 379 - Introduction to Jazz Improvisation Credits: 1
MUSI 391 - Conducting I Credits: 2
4 credits of MUSI 395 - Teaching Internship Credits: 1-4
MUSI 396 - Conducting II Credits: 2
MUSI 419 - Orchestration Credits: 3
11 credits of general MUSI electives

Choose 8 credits from the following:
MUSI 380 - Wind Symphony Credits: 1
MUSI 383 - Symphonic Band Credits: 1
MUSI 387 - Symphony Orchestra Credits: 1
MUSI 389 - Jazz Ensemble Credits: 1

Performance: String emphasis

MUSI 171 - Keyboard Skills I Credits: 1
MUSI 172 - Keyboard Skills II Credits: 1
MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
MUSI 379 - Introduction to Jazz Improvisation Credits: 1
8 credits of MUSI 387 - Symphony Orchestra Credits: 1
MUSI 391 - Conducting I Credits: 2
4 credits of MUSI 395 - Teaching Internship Credits: 1-4
MUSI 396 - Conducting II Credits: 2
MUSI 419 - Orchestration Credits: 3
11 credits of general MUSI electives

Performance: Voice emphasis

MUSI 171 - Keyboard Skills I Credits: 1
MUSI 172 - Keyboard Skills II Credits: 1
MUSI 325 - Performance Seminar and Vocal Literature for Singers and Accompanists I Credits: 2
MUSI 326 - Performance Seminar and Vocal Literature for Singers and Accompanists II Credits: 2
MUSI 341 - Diction for Singers I: Italian Diction and English Diction Credits: 2
MUSI 342 - Diction for Singers II: German Diction and French Diction Credits: 2
MUSI 352 - Vocal Pedagogy and Lab Credits: 3
MUSI 388 - Fundamental Techniques of Stagecraft for Opera and Music Theater Credits: 2
MUSI 391 - Conducting I Credits: 2
MUSI 396 - Conducting II Credits: 2
9 credits of foreign language (French, German, and/or Italian)
Choose 8 credits from the following:

- MUSI 381 - University Chorale Credits: 1
- MUSI 384 - Symphonic Chorus Credits: 1
- MUSI 385 - Chamber Singers Credits: 1

Performance: Woodwind emphasis

- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 353 - Instrumental Pedagogy and Literature Credits: 3
- MUSI 379 - Introduction to Jazz Improvisation Credits: 1
- MUSI 391 - Conducting I Credits: 2
- 4 credits of MUSI 395 - Teaching Internship Credits: 1-4
- MUSI 396 - Conducting II Credits: 2
- MUSI 419 - Orchestration Credits: 3
- 11 credits of general MUSI electives

Choose 8 credits from the following:

- MUSI 380 - Wind Symphony Credits: 1
- MUSI 383 - Symphonic Band Credits: 1
- MUSI 387 - Symphony Orchestra Credits: 1
- MUSI 389 - Jazz Ensemble Credits: 1

Total: 120 credits

**Undergraduate Interdisciplinary Minor**

**World Music Minor**

Banner Code: WMUS

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

**Faculty**

Carroll, Lepore, J. McCarthy, Owens, Robinson (coordinator)

**Requirements**
Students must complete 16 to 18 credits, with a 10-credit core and opportunities to take electives in several departments at Mason.

Prerequisite

Students must first demonstrate to the World Music coordinator a basic level of knowledge and training in some area of Western or non-Western music, or earn a grade of B or higher in MUSI 103 or 431. Prerequisites for specific courses are indicated below.

University policy states that students must earn 8 distinct credits that are not used for their major toward their minor.

Course Work

This program is designed for those who wish to widen their scope of knowledge about music while deepening their understanding of the world’s peoples. Students learn in the classroom, as well as experientially, in the form of applied studies and exercises in field work how music making functions within cultural contexts, conveying varied meanings in bodily action and musical sound worldwide. Students gain skills that will serve them in many fields of endeavor, from developing specific musical expertise to acquiring proficiency with technological and anthropological aspects of ethnographic enquiry.

Core (10 credits)

- MUSI 103 - Musics of the World Credits: 3
- ANTH 114 - Introduction to Cultural Anthropology Credits: 3
- MUSI 497 - Independent Study Credits: 1-3 (must complete 3 credits)

One of the following two courses (1 credits):

- Applied Music
  or
- Ensembles (Selection of applied music or ensemble must be approved by minor coordinator.)

Electives (6-8 credits)

Electives must be approved by the minor coordinator and should be selected from the following:

- Applied Music (1-3)
- MUSI 485 - Chamber Ensembles Credits: 1
- MUSI 102 - Popular Music in America Credits: 3
- MUSI 107 - The Development of Jazz Credits: 3
- MUSI 379 - Introduction to Jazz Improvisation Credits: 1
- DANC 118 - World Dance Credits: 3
- DANC 119 - Dance in Popular Culture: Afro-Latino Dance Credits: 3
- COMM 157 - Video Workshop Credits: 1
- COMM 305 - Foundations of Intercultural Communication Credits: 3
- ENGH 315 - Folklore and Folklife Credits: 3
- AFAM 200 - Introduction to African American Studies Credits: 3
- AFAM 390 - Special Topics in African and African American Studies Credits: 3
- AVT 378 - The African American Experience in the Performing Arts Credits: 3
ANTH 302 - Peoples and Cultures of Latin America Credits: 3
ANTH 306 - Peoples and Cultures of Island Asia Credits: 3
ANTH 309 - Peoples and Cultures of India Credits: 3

Note:
Additional electives may include summer travel courses, as appropriate, and must be approved by the minor coordinator.

Total: 16-18 credits

Undergraduate Minor

Jazz Studies Minor

Banner Code: JAZZ
Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

This minor is open to music and non music majors who wish to explore America’s unique art form. It is open to all instrumentalists and vocalists, including students who perform on instruments not normally associated with jazz. No prior experience in jazz is needed, but candidates must pass a music audition. Students in the keyboard area use the Keyboard Skills I credit as a music elective.

University policy states that students must earn 8 distinct credits that are not used for their major toward their minor.

Course Work

- 2 credits of Applied Music
- MUSI 107 - The Development of Jazz Credits: 3
- MUSI 113 - Aural Skills I Credits: 1
- MUSI 115 - Theory I Credits: 3
- MUSI 116 - Theory II Credits: 3
- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 300 - Recital Attendance Credits: 0 (two semesters)*
- MUSI 311 - Jazz Studies Credits: 3
- 3 credits of MUSI 485 - Chamber Ensembles Credits: 1 (Jazz Chamber Ensembles)
- MUSI 379 - Introduction to Jazz Improvisation Credits: 1

Note:
*All students who enroll as music minors and jazz studies minors must take MUSI 300 for two semesters. A grade of S (satisfactory) must be earned each semester.

Total: 20 credits

Music and Technology Minor

Banner Code: MUTC

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

This minor is open to majors from throughout the university who seek to expand their knowledge and skill in this area of study.

University policy states that students must earn 8 distinct credits that are not used for their major toward their minor.

Course Work (18 credits)

- MUSI 100 - Fundamentals of Music Credits: 3 or MUSI 115 - Theory I Credits: 3
- MUSI 300 - Recital Attendance Credits: 0 (2 semesters)
- MUSI 315 - Music Technology Credits: 3

Applied Music and Ensemble (3 credits)

- Applied Music or Class Voice, Guitar, or Keyboard (1-2 credits)
- MUSI 38X or 485 (Ensemble) (1-2 credits)

Two semesters of the following (6 credits):

- MUSI 300 - Recital Attendance Credits: 0
- MUSI 316 - Topics in Music Technology Credits: 3

Choose one of the following (3 credits):

- MUSI 102 - Popular Music in America Credits: 3
- MUSI 103 - Musics of the World Credits: 3
- MUSI 104 - Introduction to Twentieth-Century Music Credits: 3
- MUSI 105 - Music in the United States Credits: 3
- MUSI 107 - The Development of Jazz Credits: 3
Note:

Entrance requirements: MUSI 100 or 115 with a grade of B or higher. A music audition and interview with music technology faculty is required.

Total: 18 credits

Music Minor

Banner Code: MUSI

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

All students pursuing a music minor must pass a music audition. Students in the keyboard area use the Keyboard Skills I credit as a music elective.

University policy states that students must earn 8 distinct credits that are not used for their major toward their degree.

Course Work

- 6 credits of Applied Music
- 3 credits of Ensemble
- MUSI 101 - Introduction to Classical Music Credits: 3
- MUSI 113 - Aural Skills I Credits: 1
- MUSI 115 - Theory I Credits: 3
- MUSI 116 - Theory II Credits: 3
- MUSI 171 - Keyboard Skills I Credits: 1
- MUSI 114 - Aural Skills II Credits: 1 or MUSI 172 - Keyboard Skills II Credits: 1
- MUSI 300 - Recital Attendance Credits: 0 (two semesters)*

Note:

*All students who enroll as music minors and jazz studies minors must take MUSI 300 for two semesters. A grade of S (satisfactory) must be earned each semester.

Total: 21 credits

Master's Degree
Music, MM

Banner Code: AR-MM-MUSI

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

Faculty

Dennis Layendecker, Heritage Chair, Director

Professors: Camphouse, Carroll, Engebretson, Gardner, Layendecker (director), Maiello, Miller, Monson (associate director), Smith

Term Professors: Balakerskaia, Hearden, Rendler

Associate Professors: Aler, R. Bergman, Billingham, T. Owens

Term Associate Professor: Ker-Hackleman

Assistant Professors: Guessford, Nickens, Robinson

Term Associate Professor: Wuttke

Term Assistant Professor: Kilkenny


The expansion of professional education in the arts is paramount for the growth and development of a rich and vital cultural community and a supporting network of individual artists. The dynamics of contemporary society suggest that the influence of the arts on public life will continue to expand well into the 21st century. Each year, opportunities increase for creative work by performers, composers, sculptors, painters, dancers, actors, historians, theoreticians, and musicologists.

The MM degree is offered as an educational channel to meet the intellectual and career needs of qualified students. It is a comprehensive and advanced program of study with a choice of concentrations in performance, music education, composition, conducting, jazz studies, and pedagogy. The MM with a concentration in music education does not provide licensure to teach music in public or private schools.

Admission Requirements

In addition to fulfilling admission requirements for graduate study, applicants are expected to hold a baccalaureate degree in music or another discipline, with courses equaling the music requirements (minus the 7- to 8-credit teaching sequence) for the BA in music offered at Mason.

The following admission requirements must also be met:
• Performance: audition
• Conducting: audition
• Composition: submission of a portfolio of compositions
• Music education: interview with music faculty and submission of a two- to three-page paper on the applicant’s philosophy of music education
• Pedagogy: audition in the primary applied teaching area is required. Applicants are expected to have large and small ensemble experience on the major instrument and should have presented a full solo recital or equivalent. All music teaching experience should be summarized.
• Jazz Studies: Submit a CD of at least five jazz tunes in contrasting styles, as well as a complete repertoire list of all jazz tunes studied/perform. Submit all jazz materials to the Director of Jazz Studies at the School of Music and schedule audition.

Diagnostic Entrance Exam

All students are required to complete placement examinations in music theory, aural skills, and basic keyboard skills. These examinations must be taken prior to the beginning of the first semester of graduate study. A sufficient placement score can reduce or eliminate prerequisites for some of the 600-level and above courses in music theory and history. The exam is offered during a three-hour period prior to the beginning of classes of the fall and spring semesters. For the summer schedule, see the director of graduate studies.

Foreign Language Exams (Vocal Performance Emphasis)

Students in the MM degree program (emphasis in vocal performance) must take proficiency exams in French, German, Italian, and English to demonstrate diction competency. Students may be required to take MUSI 525, 526 Performance Seminar for Singers and Accompanists I, II.

Comprehensive Exit Exam

All students are required to pass a comprehensive exit exam administered during the graduation semester or, in the case of students selecting the thesis option in the music education concentration, on completion of 24 credits of course work and immediately before beginning work on the thesis. August graduates must take this exam during the preceding spring term. This exam is usually a three-hour written test, with questions based primarily on course work the student has taken toward the degree at Mason.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Degree Requirements

A student must successfully complete the appropriate 30 credits in graduate music courses. With approval of the graduate advisor, 3 nonmusic graduate credits may be taken.

The student is admitted as concentrating in one of six areas: performance, music education, composition, conducting, jazz studies, or pedagogy. All students are required to complete the 11 credits described below as General Requirements plus 19 credits in one of the six areas identified below as Additional Requirements. There are some limited possibilities for double concentrations. For details, see the director of graduate studies.

General Requirements for the MM (for all six options):
• Ensemble Credits: 2
• MUSI 611 - Analytical Techniques Credits: 3
• MUSI 630 - Topics in Music History and Literature Credits: 3
• MUSI 662 - Introduction to Research in Music Credits: 3

Total: 11 credits

Additional Requirements

Choose at least one concentration (19 credits) from:

▲ Concentration in Composition (CPO):

• 9 credits of MUSI 728 - Applied Music in Composition Credits: 2-3
• MUSI 613 - Graduate Orchestration Credits: 3
• MUSI 630 - Topics in Music History and Literature Credits: 3
• MUSI 790 - Graduate Recital Credits: 1
• 3 credits of electives

Total: 19 credits

▲ Concentration in Conducting (CDC):

• 9 credits of MUSI 729 - Applied Music in Conducting Credits: 2-3
• MUSI 613 - Graduate Orchestration Credits: 3
• MUSI 790 - Graduate Recital Credits: 1
• 3 credits of electives

Choose 3 credits from the following:

• MUSI 610 - Topics in Music Theory Credits: 3
• MUSI 630 - Topics in Music History and Literature Credits: 3
• MUSI 712 - Composition for Conductors and Performers Credits: 3

Note:

The number of students accepted in the graduate conducting concentration is limited by the extent to which it is possible to provide students with practical experience.

Total: 19 credits
▲ Concentration in Jazz Studies (JAZZ)

- MUSI 615 - Advanced Jazz Improvisation Credits: 3
- MUSI 650 - Topics in Jazz Studies Credits: 3
- 9 credits of MUSI 72X Graduate Applied Music
- MUSI 790 - Graduate Recital Credits: 1
- 3 credits of electives

Total: 19 credits

▲ Concentration in Music Education (MUE):

Two required courses:

- MUSI 661 - Psychology of Music Teaching and Learning Credits: 3
- MUSI 663 - Aesthetics of Music Education Credits: 3

Choose one of the three pathways: elementary-level teaching, secondary-level teaching, or thesis

**Orff Schulwerk Pathway**

- MUSI 563 - Orff Schulwerk I Credits: 3
- MUSI 564 - Orff Schulwerk II Credits: 3
- MUSI 565 - Orff Schulwerk III Credits: 3
- 4 credits general MUSI electives

**Secondary Pathway**

- 4 credits of electives
  9 advisor-approved credits chosen from:
  - MUSI 630 - Topics in Music History and Literature Credits: 3
  - MUSI 640 - Topics in World Musics Credits: 3
  - MUSI 654 - Graduate Conducting Credits: 3
  - MUSI 660 - Topics in Music Education Credits: 1-6 (for 3 credits)

**Thesis Option**

- 6 credits of MUSI 799 - Thesis Credits: 1-6
- 7 credits general MUSI electives

Total: 19 credits
▲ Concentration in Performance (PFM):

- MUSI 610 - Topics in Music Theory Credits: 3
- MUSI 630 - Topics in Music History and Literature Credits: 3
- 9 credits of MUSI 72X Graduate Applied Music
- MUSI 790 - Graduate Recital Credits: 1
- 3 credits of electives

Total: 19 credits

▲ Concentration in Pedagogy (PDGY):

- MUSI 573 - Accompanying and Musicianship III Credits: 3 (piano pedagogy only; all other areas take 3 elective credits)
- 3 credits of MUSI 660 - Topics in Music Education Credits: 1-6
- MUSI 695 - Teaching Internship Credits: 2
- 1 credit of MUSI 690 - Graduate Lecture Recital Credits: 1-3
- 6 credits of MUSI 72X Graduate Applied Music
- MUSI 790 - Graduate Recital Credits: 1
  Choose 3 credits from the following:
  - MUSI 551 - Keyboard Pedagogy I Credits: 3
  - MUSI 552 - Vocal Pedagogy and Lab Credits: 3
  - MUSI 553 - Instrumental Pedagogy and Literature Credits: 3

Total: 19 credits

Total: 30 credits

Master's Level Certificate

Instrumental Performance Artist Graduate Certificate
The certificate is a specialized, graduate-level program for advanced musicians who desire to further develop and refine their performance art. The certificate program is a two-year course of study requiring at least two consecutive semesters of residence. A total of 32 credits is required. Advisor’s approval is required for each semester’s enrollment.

This certificate may be earned on a full time or part time basis.

**Admission Requirements**

- An artist certificate application and current résumé
- A bachelor’s degree in music or equivalent (as evaluated by the School of Music Admissions Committee)
- Transcripts from previous educational institutions
- One-page written statement of student’s goals and interest in the program
- Two letters of recommendation
- A CD (preferred), audiocassette, or videotape of a live performance of solo works from the standard repertory. Applicants must perform an audition recital and be interviewed on the Mason Campus. Applicants will be notified of the date and time of the audition and interview.
Certificate Requirements

Studies in Performance (17 credits)

- MUSI 72X Graduate Applied Music (over four semesters) Credits: 12
- 2 credits of MUSI 592 - Topics in Music Credits: 1-6
- 3 credits of MUSI 790 - Graduate Recital Credits: 1 (two semesters of solo recitals and one semester of chamber recital)

Support Studies in Literature and Pedagogy (8 credits)

- MUSI 630 - Topics in Music History and Literature Credits: 3 or MUSI 730 - Advanced Topics in Music History Credits: 3
- MUSI 551 - Keyboard Pedagogy I Credits: 3 or MUSI 553 - Instrumental Pedagogy and Literature Credits: 3
- MUSI 695 - Teaching Internship Credits: 2

Support Studies in Accompanying or Ensemble plus Electives (7 credits)

(choose A or B)

A

- MUSI 571 - Techniques of Accompanying I Credits: 1
- MUSI 685 - Graduate Chamber Ensemble Credits: 1
- 5 credits of electives

B

- MUSI 682 - Wind Symphony Credits: 1
- MUSI 683 - Symphonic Band Credits: 1
- MUSI 685 - Graduate Chamber Ensemble Credits: 1
- MUSI 687 - Symphony Orchestra Credits: 1
- MUSI 689 - Jazz Ensemble Credits: 1
- 1 credit of electives

Note:

One of MUSI 682, MUSI 683, MUSI 685, MUSI 687 or MUSI 689 must be taken twice.

Total: 32 credits
Piano Performance Artist Graduate Certificate

Banner Code: AR-CERG-ACPP
Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

Faculty

Dennis Layendecker, Heritage Chair, Director

Professors: Camhouse, Carroll, Engebretson, Gardner, Layendecker (director), Maiello, Miller, Monson (associate director), Smith

Term Professors: Balakerskaia, Hearden, Rendler

Associate Professors: Aler, R. Bergman, Billingham, T. Owens

Term Associate Professor: Ker-Hackleman

Assistant Professors: Guessford, Nickens, Robinson

Term Associate Professor: Wuttke

Term Assistant Professor: Kilkenny


The certificate is a specialized, graduate-level program for advanced musicians who desire to further develop and refine their performance art. The certificate program is a two-year course of study requiring at least two consecutive semesters of residence. A total of 32 credits is required. Advisor’s approval is required for each semester’s enrollment.

This certificate may be earned on a full time or part time basis.

Admission Requirements

- An artist certificate application and current résumé
- A bachelor’s degree in music or equivalent (as evaluated by the School of Music Admissions Committee)
- Transcripts from previous educational institutions
- One-page written statement of student’s goals and interest in the program
- Two letters of recommendation
- A CD (preferred), audiocassette, or videotape of a live performance of solo works from the standard repertory.
Applicants must perform an audition recital and be interviewed on the Mason Campus. Applicants will be notified of the date and time of the audition and interview.

Certificate Requirements

Studies in Performance (17 credits)

- MUSI 72X Graduate Applied Music (over four semesters) Credits: 12
- 2 credits of MUSI 592 - Topics in Music Credits: 1-6
- 3 credits of MUSI 790 - Graduate Recital Credits: 1 (two semesters of solo recital and one semester of chamber recital)

Support Studies in Literature and Pedagogy (8 credits)

- MUSI 630 - Topics in Music History and Literature Credits: 3 or MUSI 730 - Advanced Topics in Music History Credits: 3
- MUSI 551 - Keyboard Pedagogy I Credits: 3 or MUSI 553 - Instrumental Pedagogy and Literature Credits: 3
- MUSI 695 - Teaching Internship Credits: 2

Support Studies in Accompanying or Ensemble plus Electives (7 credits)

(choose A or B)

A

- MUSI 571 - Techniques of Accompanying I Credits: 1
- MUSI 685 - Graduate Chamber Ensemble Credits: 1
- 5 credits of electives

B

- MUSI 682 - Wind Symphony Credits: 1
- MUSI 683 - Symphonic Band Credits: 1
- MUSI 685 - Graduate Chamber Ensemble Credits: 1
- MUSI 687 - Symphony Orchestra Credits: 1
- MUSI 689 - Jazz Ensemble Credits: 1
- 1 credit of electives

Note:

One of MUSI 682, MUSI 683, MUSI 685, MUSI 687 or MUSI 689 must be taken twice.
Total: 32 credits

Vocal Performance Artist Graduate Certificate

Banner Code: AR-CERG-ACVP

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

Faculty

Dennis Layendecker, Heritage Chair, Director

Professors: Camphouse, Carroll, Engebretson, Gardner, Layendecker (director), Maiello, Miller, Monson (associate director), Smith

Term Professors: Balakerskaia, Hearden, Rendler

Associate Professors: Aler, R. Bergman, Billingham, T. Owens

Term Associate Professor: Ker-Hackleman

Assistant Professors: Guessford, Nickens, Robinson

Term Associate Professor: Wuttke

Term Assistant Professor: Kilkenny


The certificate is a specialized, graduate-level program for advanced musicians who desire to further develop and refine their performance art. The certificate program is a two-year course of study requiring at least two consecutive semesters of residence. A total of 32 credits is required. Advisor’s approval is required for each semester’s enrollment.

This certificate may be earned on a full time or part time basis.

Admission Requirements

- An artist certificate application and current résumé
- A bachelor’s degree in music or equivalent (as evaluated by the School of Music Admissions Committee)
Transcripts from previous educational institutions
One-page written statement of student’s goals and interest in the program
Two letters of recommendation
A CD (preferred), audiocassette, or videotape of a live performance of solo works from the standard repertory.
Applicants must perform an audition recital and be interviewed on the Mason Campus. Applicants will be notified of the date and time of the audition and interview.

Certificate Requirements

Studies in Performance (20 credits)

- 12 credits of MUSI 723 - Applied Music in Voice Credits: 2-3
- 4 credits of MUSI 592 - Topics in Music Credits: 1-6
- MUSI 526 - Performance Seminar and Vocal Literature for Singers and Accompanists II Credits: 2
- MUSI 541 - Diction for Singers I: Italian Diction and English Diction Credits: 2 or MUSI 542 - Diction for Singers II: German Diction and French Diction Credits: 2

Support Studies in Ensemble Performance plus Electives (12 credits)

- 9 credits of MUSI 685 - Graduate Chamber Ensemble Credits: 1 AND MUSI 688 - Opera and Musical Theater Ensemble Credits: 3
- 1 credit of MUSI 690 - Graduate Lecture Recital Credits: 1-3
- MUSI 790 - Graduate Recital Credits: 1
- 1 credit of electives

Total: 32 credits

Doctoral Degree

Music Education, PhD

Banner Code: AR-PHD-MUE

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

Faculty

Dennis Layendecker, Heritage Chair, Director
Professors: Camphouse, Carroll, Engebretson, Gardner, Layendecker (director), Maiello, Miller, Monson (associate director), Smith

Term Professors: Balakerskaia, Hearden, Rendler

Associate Professors: Aler, R. Bergman, Billingham, T. Owens

Term Associate Professor: Ker-Hackleman

Assistant Professors: Guessford, Nickens, Robinson

Term Assistant Professor: Wuttke

Term Assistant Professor: Kilkenny


The PhD in music education and the doctor of musical arts degree require 90 credits, 60 beyond the master’s degree in music.

The PhD in music education, a research-intensive degree, focuses on the gathering, processing, and interpretation of information. Students in the PhD program take seminars and topics courses in music education, as well as research courses through the College of Education and Human Development. PhD graduates are expected to demonstrate the ability to communicate significant concepts of music education.

Admission Requirements

In addition to meeting all admission requirements for graduate study, applicants should submit the following:

- Master’s degree in music from an accredited university
- GPA of 3.00 in master’s-level music course work; 3.50 in courses related to the prospective area of doctoral study (music education, performance, composition, or conducting)
- Three recommendations
- Satisfactory scores on GRE
- A sample of academic writing such as a graduate-level paper from a musicology or music history course taken during MM studies
- Students in performance and conducting must audition. Specific details of those requirements are available from the advisors.
- Composition students must present a portfolio of recent compositions and recordings of performances.
- Music education majors must present a dossier of their teaching experience and activities, and they must schedule an interview with music faculty including the director of graduate studies (DGS) prior to admission.
- There is no “provisional” admission. Students must meet appropriate standards prior to commencing doctoral studies.

Reduction of Credit
Students must have a master's degree before being admitted to the Doctor of Musical Arts Program. Most students receive a reduction of study of 30 credits based on their previous master's degree.

**Academic Policies**

Please see College of Visual and Performing Arts for college academic policies.

**Degree Requirements**

The following degree plan is based on a student who receives a full 30 credit reduction. Students who do not receive a full credit reduction should choose additional credits in consultation with their advisor.

**Placement Examinations**

Prior to the beginning of the first semester of doctoral studies, the student must complete placement examinations in music theory, music history, and musicianship (including aural skills and keyboard skills). Positive scores on the placement exams may reduce or eliminate prerequisites for courses in music history and music theory. Recitals can be scheduled only after completion of any necessary prerequisites in music theory, music history, and musicianship.

**Doctoral Course Work (48 credits)**

The doctoral student must maintain a minimum of 3.00 GPA in courses presented on the degree plan, which may include no more than 6 credits with a grade of C. The GPA calculation excludes all transfer courses and Mason extended studies or nondegree credits not formally approved for the degree.

- Research Courses (advisor-approved CEHD) Credits: 9
- 6 credits of MUSI 610 - Topics in Music Theory Credits: 3 or MUSI 710 - Advanced Topics in Music Theory Credits: 3
- MUSI 630 - Topics in Music History and Literature Credits: 3 or MUSI 730 - Advanced Topics in Music History Credits: 3
- MUSI 640 - Topics in World Musics Credits: 3
- 3 credits of MUSI 660 - Topics in Music Education Credits: 1-6
- MUSI 810 - Doctoral Seminar in Analysis Credits: 3 or MUSI 830 - Doctoral Seminar in Music History Credits: 3
- 12 credits of MUSI 860 - Doctoral Seminar in Music Education Credits: 3
- 3 credits of MUSI 880 - Doctoral Major Ensemble Credits: 1
- 6 credits of approved electives*

**Note:**

*Approved electives could be from music history, music literature, world music, music theory, conducting, music education, secondary Applied Music, ensemble (including chamber music), or relevant nonmusic courses.

**Residency**

One year (fall and spring) of consecutive full-time study (9 credits per semester) is required (18 total credits). Or, the academic residency requirement may be fulfilled by earning 21 credits within 12 months (fall and spring semesters and summer term). Academic residency should be completed during the first year of study. Any necessary prerequisite courses at the 500 level can
be included to meet the residency requirement. Language courses at the undergraduate level may not be included. Note: The academic residency does not imply meeting the standards of Virginia residency for tuition purposes.

Language Requirements

Reading proficiency is required in a language appropriate to the student’s major area of study. Normally, this will be German, French, or Italian. The dean of graduate studies and the student’s Faculty Committee will determine the appropriate area of study. Reading proficiency may be accomplished by completing a reading examination provided by the music faculty. The reading examination provided by the faculty will normally consist of translation (with dictionary) of appropriate technical passages relevant to the student’s area of study within a two-hour period. The language reading proficiency should be completed prior to earning 12 credits of courses at the 600 level or above.

Faculty Committee

During the first semester of study, the college’s dean of graduate studies will recommend to the dean of the College of Visual and Performing Arts five faculty members to serve as the student’s Faculty Committee: two from the student’s area of specialization (performance, conducting, or composition), one from music theory, one from music history, and one at large. The student’s major professor will chair the committee. The director of graduate studies of the School of Music may be part of the committee; if not, he or she will serve exofficio. All Faculty Committee members will have graduate faculty status, as approved by the university provost.

The Faculty Committee will evaluate the progress of the student annually. Continuation in the program is subject to the endorsement of this group. Performance and composition recitals and projects moving toward the dissertation are also subject to approval of the committee.

Comprehensive Exams

After the completion of required courses (excluding dissertation credits) or during the semester when completion of those courses is anticipated, the student will take comprehensive examinations. The written exams may also be followed by a one-hour oral exam if needed to clarify issues included in the written exams.

Doctoral Research (12 credits)

- 3 credits of MUSI 998 - Dissertation Proposal Credits: 1-3
- 9 credits of MUSI 999 - Dissertation Credits: 1-12

Advancement to Candidacy

Before doctoral students may be advanced to candidacy by the dean of the College of Visual and Performing Arts, they must complete all course work required by the program faculty, be certified in all relevant doctoral research skills, pass the comprehensive exams, and be recommended by the Faculty Committee, the dean of graduate studies, and the director of the School of Music. Students advanced to candidacy after the add period for a given semester must wait until the following semester to register for MUSI 999 Dissertation.

Dissertation
The dissertation is the capstone experience of doctoral study. The dissertation will be guided by the Dissertation Committee. This group may be the student’s Faculty Committee as described above, plus a faculty member from beyond the School of Music. All Dissertation Committee members will be appointed by the dean of the College of Visual and Performing Arts and have graduate faculty status, as approved by the university provost.

Final Defense and Graduation

When all degree requirements have been satisfied, including completion of the doctoral dissertation, the doctoral candidate may request a doctoral defense. Approval for the defense must be obtained from the Dissertation Committee, the director of graduate studies and the director of the School of Music, and the dean of the College of Visual and Performing Arts. Notice of a defense must be circulated to the university community two weeks before the defense date.

All relevant rules regarding schedule, fees, and other matters as described in the catalog must be followed. All copies of the dissertation materials and fees must be paid before the doctoral degree is awarded.

Total: 90 credits

Musical Arts, DMA

Banner Code: AR-DMA-MUAR

Performing Arts Building, Room A417
Phone: 703-993-1380
Web: music.gmu.edu

Faculty

Dennis Layendecker, Heritage Chair, Director

Professors: Camphouse, Carroll, Engebretson, Gardner, Layendecker (director), Maiello, Miller, Monson (associate director), Smith

Term Professors: Balakerskaia, Hearden, Rendler

Associate Professors: Aler, R. Bergman, Billingham, T. Owens

Term Associate Professor: Ker-Hackleman

Assistant Professors: Guessford, Nickens, Robinson

Term Associate Professor: Wuttke

Term Assistant Professor: Kilkenny

The doctor of musical arts requires 90 credits, 60 credits beyond the Master's degree in music. The doctor of musical arts concentrations are composition, conducting, and performance. While these concentrations share some of the required course work, each is also distinct in course requirements. Professional musicians earn the DMA to enhance and extend their knowledge and practice within their area of specialization. The DMA student focuses on the profession of music performance, as well as the theory and practice of the discipline.

Admission Requirements

In addition to meeting all admission requirements for graduate study, applicants should submit the following:

- Master’s degree in music from an accredited university
- GPA of 3.00 in master's-level music course work; 3.50 in courses related to the prospective area of doctoral study (performance, composition, or conducting)
- Three recommendations
- Satisfactory scores on GRE
- A sample of academic writing such as a graduate-level paper from a musicology or music history course taken during MM studies
- Students in performance and conducting must audition. Specific details of those requirements are available from the advisors.
- Composition students must present a portfolio of recent compositions and recordings of performances.
- There is no “provisional” admission. Students must meet appropriate standards prior to commencing doctoral studies.

Reduction of Credit

Students must have a master's degree before being admitted to the Doctor of Musical Arts Program. Most students receive a reduction of study of 30 credits based on their previous master's degree.

Academic Policies

Please see College of Visual and Performing Arts for college academic policies.

Degree Requirements

The following degree plan is based on a student who receives a full 30 credit reduction. Students who do not receive a full credit reduction should choose additional credits in consultation with their advisor.

Placement Examinations

Prior to the beginning of the first semester of doctoral studies, the student must complete placement examinations in music theory, music history, and musicianship (including aural skills and keyboard skills). Positive scores on the placement exams may reduce or eliminate prerequisites for courses in music history and music theory. Recitals can be scheduled only after completion of any necessary prerequisites in music theory, music history, and musicianship.
Doctoral Course Work (47 credits)

The doctoral student must maintain a minimum of 3.00 GPA in courses presented on the degree plan, which may include no more than 6 credits with a grade of C. The GPA calculation excludes all transfer courses and Mason extended studies or non degree credits not formally approved for the degree.

Students must complete the following required courses as well as those in their chosen concentration:

- History or Theory elective (600 level or above) Credits: 3
- MUSI 830 - Doctoral Seminar in Music History Credits: 3
- 2 credits of MUSI 890 - Doctoral Recital Credits: 1

▲ Concentration in Composition (CPO)

- 1 credit of approved electives*
- MUSI 610 - Topics in Music Theory Credits: 3 or MUSI 710 - Advanced Topics in Music Theory Credits: 3
- MUSI 614 - Music Theory Pedagogy Credits: 3
- 4 credits of MUSI 685 - Graduate Chamber Ensemble Credits: 1
- 6 credits of MUSI 810 - Doctoral Seminar in Analysis Credits: 3
- 15 credits of MUSI 828 - Doctoral Applied Music in Composition Credits: 2-3
- MUSI 880 - Doctoral Major Ensemble Credits: 1

Choose 6 credits from the following:
- MUSI 630 - Topics in Music History and Literature Credits: 3
- MUSI 640 - Topics in World Musics Credits: 3
- MUSI 730 - Advanced Topics in Music History Credits: 3

▲ Concentration in Conducting (CDC)

- 5 credits of approved electives*
- 6 credits of MUSI 630 - Topics in Music History and Literature Credits: 3 and/or MUSI 730 - Advanced Topics in Music History Credits: 3
- MUSI 770 - Advanced Topics in Pedagogy Credits: 3
- MUSI 810 - Doctoral Seminar in Analysis Credits: 3
- 15 credits of MUSI 829 - Doctoral Applied Music in Conducting Credits: 2-3
- 4 credits of MUSI 880 - Doctoral Major Ensemble Credits: 1

Choose 3 credits from the following:
- MUSI 610 - Topics in Music Theory Credits: 3
- MUSI 710 - Advanced Topics in Music Theory Credits: 3
- MUSI 712 - Composition for Conductors and Performers Credits: 3

▲ Concentration in Performance (PFM)

- MUSI 82X Doctoral Applied Music Credits: 15
- 3 credits of approved electives*
- 6 credits of MUSI 630 - Topics in Music History and Literature Credits: 3 and/or MUSI 730 - Advanced Topics in Music History Credits: 3
• 2 credits of MUSI 685 - Graduate Chamber Ensemble Credits: 1 or MUSI 720 - Advanced Topics in Applied Music Credits: 3
• MUSI 770 - Advanced Topics in Pedagogy Credits: 3
• MUSI 810 - Doctoral Seminar in Analysis Credits: 3
• 4 credits of MUSI 880 - Doctoral Major Ensemble Credits: 1 and/or MUSI 720 - Advanced Topics in Applied Music Credits: 3

Choose 3 credits from the following:
• MUSI 610 - Topics in Music Theory Credits: 3
• MUSI 710 - Advanced Topics in Music Theory Credits: 3
• MUSI 712 - Composition for Conductors and Performers Credits: 3

Note:

*Approved electives could be from music history, music literature, world music, music theory, conducting, music education, secondary Applied Music, ensemble (including chamber music), or relevant nonmusic courses.

Residency

More than half of all credits (minimum 72) must be taken in doctoral degree status, after admission to the degree program. One year (fall and spring) of consecutive full-time study (9 credits per semester; 18 credits per year) is recommended. Or, the academic residency requirement may be fulfilled by earning 21 credits within 12 months (fall and spring semesters and summer term). Academic residency should be completed during the first year of study. Any necessary prerequisite courses at the 500 level can be included to meet the residency requirement. Language courses at the undergraduate level may not. Note: The academic residency does not imply meeting the standards of Virginia residency for tuition purposes.

Language Requirements

Reading proficiency is required in a language appropriate to the student’s major area of study. Normally, this will be German, French, or Italian. The DGS and the student’s Faculty Committee will determine the appropriate area of study. Reading proficiency may be accomplished by completing a reading examination provided by the music faculty. The reading examination provided by the faculty will normally consist of translation (with dictionary) of appropriate technical passages relevant to the student’s area of study within a two-hour period. The language reading proficiency should be completed prior to earning 12 credits of courses at the 600 level or above.

Graduate Committee

The Graduate Committee will evaluate the progress of the student annually. Continuation in the program is subject to the endorsement of this group.

Comprehensive Exams

After the completion of required courses (excluding dissertation credits) or during the semester when completion of those courses is anticipated, the student will take comprehensive examinations. The written exams will be followed by a one-hour oral exam to clarify issues included in the written exams.

Doctoral Research (13 credits)
Advancement to Candidacy

Before doctoral students may be advanced to candidacy by the dean of the College of Visual and Performing Arts, they must complete all course work required by the program faculty, be certified in all relevant doctoral research skills, pass the comprehensive exams, and be recommended by the Faculty Committee, the dean of graduate studies, and the chair of the School of Music. Students advanced to candidacy after the add period for a given semester must wait until the following semester to register for MUSI 999 Dissertation.

Dissertation Committee

The dissertation is the capstone experience of doctoral study. The dissertation will be guided by the Dissertation Committee consisting of at least three members of the music faculty. The student's major professor will chair the committee. The director of graduate studies of the School of Music may be part of the committee; if not, he or she will serve ex officio. All Dissertation Committee members will be appointed by the dean of the College of Visual and Performing Arts and have graduate faculty status, as approved by the university provost. Performance and composition recitals are also subject to the approval of the Dissertation Committee.

Final Defense and Graduation

When all degree requirements have been satisfied, including completion of the doctoral dissertation, the doctoral candidate may request a doctoral defense. Approval for the defense must be obtained from the Dissertation Committee, the director of graduate studies and the director of the School of Music, and the dean of the College of Visual and Performing Arts. Notice of a defense must be circulated to the university community two weeks before the defense date.

All relevant rules regarding schedule, fees, and other matters as described in the catalog must be followed. All copies of the dissertation materials and fees must be paid before the doctoral degree is awarded.

Total: 90 credits

■ Theater

Performing Arts Building, Room A407
Phone: 703-993-1120
Web: theater.gmu.edu

Faculty

Ken Elston, Chair

Professors: D’Andrea (Robinson Professor), Davis, McDonald

Associate Professors: Austin, Elston, Gero, Johnsen-Neshati, Kurtz

Term Associate Professor: Chew
Adjunct Faculty: Cadby, Cetron, Dunayer, Gaines, Lechter, Lee, Maier, McManus, Mountain, Murray, Nanni-Messegee, Wallace

Course Work

The Theater Department offers all course work designated THR in the Courses chapter of this catalog.

Undergraduate Programs

The Theater Department offers BA and BFA degrees, both requiring completion of 120 hours of course work. Entrance into either program is by interview and audition or portfolio review. Information about the audition, portfolio review and interview process, including dates, can be found on the department web page, theater.gmu.edu/admissions or by calling the department office at 703-993-1120. Admission to the University is determined by the Admissions Office.

The department aims to prepare students for graduate study or entry into the profession through rigorous, concentrated, and individualized training; however, students are encouraged to maintain wide-ranging interests within the department and throughout the university’s extensive offerings.

Students seeking to earn a BA or BFA as a second bachelor’s degree, either concurrently or sequentially, must complete all theater degree requirements. Students must earn a minimum 2.00 cumulative GPA in their major.

Theater BA

Theater majors organize their advanced work within the major to include classes in at least two areas of emphasis including Performance, Design and Technical Theater, and Theater Studies.

Theater BA Concentrations

Theater majors may apply to complete their Bachelor of Arts degree in one of the following concentrations: Design and Technical Theater, Performance (Acting and Directing), Playwriting and Dramaturgy, Teaching Theatre Arts PK-12, or Theater Studies. University application deadlines and a link to the application form can be found on the department web page, theater.gmu.edu/admissions or by calling the department office at 703-993-1120.

Theater BFA Concentrations

In addition to the general education requirements for the Bachelor of Arts degree, Theater Bachelor of Fine Arts majors must complete a minimum of 80 hours in the major: 32 credits of required core courses and 48 hours in a concentration. Concentrations are: Design for Stage and Screen, Performance for Stage and Screen (Acting and Directing), Writing and Dramaturgy for Stage and Screen.

Writing-Intensive Requirement

The university requires all students to complete at least one course designated writing-intensive in their major at the 300 level or above. Students seeking a BA in theater fulfill this requirement by successfully completing THR 350 or THR 482.

Certification for Teaching Theatre Arts PK-12
The Teaching Theatre Arts PK-12 concentration is approved by the Virginia State Department of Education and administered through the College of Education and Human Development, which is accredited by the National Council for the Accreditation of Teacher Education (NCATE). Minimum scores on the Praxis I and VCLA tests must be achieved before state licensure is granted.

Students must be formally accepted into the Teaching Theatre Arts PK-12 concentration. See Teaching Theatre Arts PK-12 concentration for a complete list of requirements.

Production Opportunities

Participation in Theater at Mason productions is expected of all declared majors.

All Theater majors must enroll in THR 191 each semester. It is a zero (0) credit class, graded S/NC, that is successfully completed by attending productions, guest lectures, workshops; participation in production load-in; and participation in production strike.

Students must also earn four (4) practicum credits, one (1) credit for satisfactory completion (a minimum of 30 hours) of each of four (4) performance and production assignments in the major, including faculty or guest-directed Mason Players Mainstage, and student-directed Studio productions.

All freshmen, first year transfer, and new Theater majors must register for one (1) THR 198 credit and one (1) THR 199 credit during their first academic year.

Assignments for THR 196 and THR 197 will include a presentation of portfolio documents demonstrating a practical analysis of the role, design, or support position to subject area mentors.

- THR 196 assignments including actor, designer, assistant designer, stage manager, and assistant stage manager.
- THR 197 assignments include director, assistant director, dramaturg, master electrician, technical director, playwright, house management, and publicity.
- THR 198 assignments include scenery construction and painting, costume construction, electrician, and props.
- THR 199 assignments include stage crew, light board operator, sound board operator, wardrobe, and fly crew.

Unless registered for a Theater course approved as directly connected to production (i.e. THR 196-199, 492 or 495) all students (including non-Theater majors) electing to participate in a Theater at Mason production must register for THR 200 concurrent with participation.

Theater Honors Program

Highly qualified students who have completed 75 credits may pursue advanced work leading to graduation with honors in the major. Students apply for Honors in Theater by submitting to the Chair (by November 15 or April 15) a two-page written statement outlining their reasons for pursuing advanced coursework and specific professional goals, along with the names of two Mason theater faculty members who have agreed to serve as references.

Students satisfy the honors course sequence by taking three Honors specific courses from their chosen concentration. They must also maintain an overall GPA of 3.50 and a GPA of 3.75 within the major.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

Undergraduate Degree
Theater, BA

Banner Code: AR-BA-THR

Performing Arts Building, Room A407
Phone: 703-993-1120
Web: theater.gmu.edu

Faculty

Ken Elston, Chair

Professors: D'Andrea (Robinson Professor), Davis, McDonald

Associate Professors: Austin, Elston, Gero, Johnsen-Neshati, Kurtz

Term Associate Professor: Chew

Adjunct Faculty: Cadby, Cetron, Dunayer, Gaines, Lechter, Lee, Maier, McManus, Mountain, Murray, Nanni-Messegee, Wallace

Program

The BA degree stresses the breadth of a liberal arts education in the belief that such study, combined with serious practical training and experience, offers the best preparation for a life in the theater. Entrance into the program is by interview and audition or portfolio review. Information about the audition, portfolio review and interview process, including dates, can be found on the department web page, theater.gmu.edu/admissions or by calling the department office at 703-993-1120. Admission to the University is determined by the Admissions Office.

Students electing to major in theater complete the theater core, which is a group of courses providing a broad introduction to the various theater arts and striving to create a shared body of knowledge within the department's student population.

To organize their advanced work within the major, students select 24 credits of 300-400-level courses, chosen from at least two areas of emphasis including Performance, Design and Technical Theater, and Theater Studies, or elect a course of study in one of five concentrations: Performance (Acting and Directing), Design and Technical Theater, Playwriting and Dramaturgy, Teaching Theatre Arts PK-12, or Theater Studies. The department aims to prepare students for graduate study or entry into the profession through rigorous, concentrated, and individualized training; however, students are encouraged to maintain wide-ranging interests within the department and throughout the university’s extensive offerings.

Students seeking to earn a BA as a second bachelor’s degree, either concurrently or sequentially, must complete all theater degree requirements. Students must earn a minimum 2.00 cumulative GPA in their major.

Theater BA Concentrations

Theater majors may apply to complete their degree in one of the following concentrations: Design and Technical Theater, Performance (Acting and Directing), Playwriting and Dramaturgy, Teaching Theatre Arts PK-12, or Theater Studies. Information about the application can be found on the department web page, theater.gmu.edu/admissions or by calling the department office at 703-993-1120.

Certification for Teaching Theatre Arts PK-12

George Mason University 2012-2013 Official University Catalog 1280
The Teaching Theatre Arts PK-12 concentration is approved by the Virginia State Department of Education and administered through the College of Education and Human Development, which is accredited by the National Council for the Accreditation of Teacher Education (NCATE). Minimum scores on the Praxis I and VCLA tests must be achieved before state licensure is granted.

Students must be formally accepted into the Teaching Theatre Arts PK-12 concentration. See Teaching Theatre Arts PK-12 concentration for a complete list of requirements.

Writing-Intensive Requirement

The university requires all students to complete at least one course designated writing-intensive in their major at the 300 level or above. Students seeking a BA in theater fulfill this requirement by successfully completing THR 350 or THR 482.

Course Work

The Theater Department offers all course work designated THR in the Courses chapter of this catalog.

Production Opportunities

Participation in Theater at Mason productions is expected of all declared majors.

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Assignments for THR 196 and THR 197 will include a presentation of portfolio documents demonstrating a practical analysis of the role, design, or support position to subject area mentors.

- THR 196 assignments including actor, designer, assistant designer, stage manager, and assistant stage manager.
- THR 197 assignments include director, assistant director, dramaturg, master electrician, technical director, playwright, house management, and publicity.
- THR 198 assignments include scenery construction and painting, costume construction, electrician, and props.
- THR 199 assignments include stage crew, light board operator, sound board operator, wardrobe, and fly crew.

Unless registered for a Theater course approved as directly connected to production (i.e. THR 196-199, 492 or 495) all students (including non-Theater majors) electing to participate in a Theater at Mason production must register for THR 200 concurrent with participation.

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Highly qualified students who have completed 75 credits may pursue advanced work leading to graduation with honors in the major. Students apply for Honors in Theater by submitting to the Chair (by November 15 or April 15) a two-page written statement outlining their reasons for pursuing advanced coursework and specific professional goals, along with the names of two Mason theater faculty members who have agreed to serve as references.
Students satisfy the honors course sequence by taking three Honors specific courses from their chosen concentration. They must also maintain an overall GPA of 3.5 and a GPA of 3.75 within the major.

Academic Policies

Please see College of Visual and Performing Arts academic policies.

Degree Requirements

General Education (40 credits)

Foundation Requirements

- Oral communication Credits: 3
- Information technology Credits: 3
- Quantitative reasoning Credits: 3
- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
  Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as in 302, to fulfill degree requirements.

Core Requirements

- Literature Credits: 3
- Arts (outside the major) (students earning a concentration in Design and Technical Theater must take ARTH 101, 102, 200 or 201) Credits: 3
- Natural science (including one laboratory science) Credits: 7
- Western civilization Credits: 3
- Global understanding Credits: 3
- Social and behavioral sciences Credits: 3
- Synthesis requirement (see concentration for specific requirement) Credits: 3

Major (56-78 credits)

Foreign Language, Minor, Double Major or Double Degree (0–21 credits)

See beginning of CVPA chapter for foreign language requirement.

Students may complete an academic minor, double major or double degree in lieu of the foreign language requirement.

Theater Core Requirements (32-33 credits)
• Additional literature (3)
• Additional arts (outside the major) (students earning a concentration in Design and Technical Theater must take AVT 104 or 222) Credits: 3–4
• THR 150 - Drama, Stage, and Society I Credits: 3
• THR 151 - Drama, Stage, and Society II Credits: 3
• THR 191 - Practical Theater Seminar Credits: 0 (Must be taken each semester registered up to a maximum of 12 semesters)
• THR 196 - Performance and Design Practicum Credits: 1
• THR 197 - Management/Literary Practicum Credits: 1
• THR 198 - Theatrical Construction Practicum Credits: 1
• THR 199 - Production Run Crew Practicum Credits: 1
• THR 210 - Acting I Credits: 3
• THR 230 - Introduction to Technical Theater Credits: 3
• THR 329 - Directing I Credits: 3
• THR 350 - Script Analysis Credits: 3

One upper-level dramatic literature course (3 credits)

Students earning a concentration in Playwriting and Dramaturgy must take THR 351.

• THR 351 - Dramatic Theory and Criticism Credits: 3
• THR 352 - Dramatic Literature Seminar Credits: 3
• THR 355 - Moral Vision in American Theater Credits: 3
• THR 359 - World Stages Credits: 3 (May be applied to fulfill either the global understanding or upper-level dramatic literature requirement but not both)
• THR 395 - Theater as the Life of the Mind Credits: 3
• THR 424 - Contemporary Women Playwrights Credits: 3

One from the following group of 1-credit minicourses:

Students earning a concentration in Playwriting and Dramaturgy must take THR 202

• THR 201 - Stage Management Credits: 1
• THR 202 - Literary Management Credits: 1
• THR 203 - Production/Company Management Credits: 1

Upper-Level Units:

• 24 credits of 300- and 400-level courses, chosen from at least two of the following areas: performance, design and technical theater, and theater studies. These credits are in addition to upper-level credits taken to fulfill theater core requirements.

Performance (Acting and Directing) Courses
This emphasis is designed for the serious student of acting and/or directing with performance aspirations. Solid grounding in the fundamentals of analysis and basic training of the actor’s instrument are complemented by intensive, individualized instruction in the various facets of the actor’s craft.

- THR 300 - Voice and Speech I Credits: 3
- THR 301 - Voice and Speech II Credits: 3
- THR 303 - Movement for the Actor I Credits: 3
- THR 304 - Movement for the Actor II Credits: 3
- THR 305 - Stage Combat Credits: 3
- THR 310 - Acting II Credits: 3
- THR 320 - Beginning Modern Acting Credits: 3
- THR 321 - Acting Shakespeare Credits: 3
- THR 342 - Makeup Design Credits: 3
- THR 345 - Puppetry: History and Technique Credits: 2-4
- THR 365 - Characterization Credits: 3
- THR 420 - Advanced Modern Acting Credits: 3
- THR 421 - One-Person Show Credits: 3
- THR 423 - Audition Techniques: Stage and Camera Credits: 3
- THR 425 - Verse Speaking Credits: 3

Design and Technical Theater Courses

This emphasis prepares students for further study and work in the design and technical fields. Courses in this area are also strongly recommended for students interested in directing.

- THR 314 - Lighting Stagecraft Credits: 3
- THR 315 - Sound Engineering Credits: 3
- THR 330 - Seminar in Technical Theater Credits: 3
- THR 331 - Drafting and Model Making Credits: 3
- THR 332 - Seminar in Costume History Credits: 3
- THR 333 - Stage Design Credits: 3
- THR 334 - Lighting Design Credits: 3
- THR 335 - Costume Design Credits: 3
- THR 336 - Advanced Theater Technology Credits: 3
- THR 337 - Sound Design Credits: 3
- THR 339 - Theatrical Design Concepts Credits: 3
- THR 343 - Costume Draping and Drafting Credits: 3
- THR 434 - Advanced Lighting Design Credits: 3

Theater Studies Courses

This emphasis is designed to provide the theater generalist with thorough preparation for further study and work in directing, dramaturgy, theater criticism, theater scholarship, playwriting, and arts management.

- THR 340 - Directing II Credits: 3
- THR 351 - Dramatic Theory and Criticism Credits: 3
- THR 352 - Dramatic Literature Seminar Credits: 3
- THR 355 - Moral Vision in American Theater Credits: 3
- THR 359 - World Stages Credits: 3
- THR 380 - Playwriting I Credits: 3
- THR 381 - Playwriting II Credits: 3
- THR 382 - Screenplay Workshop Credits: 3
- THR 395 - Theater as the Life of the Mind Credits: 3
- THR 424 - Contemporary Women Playwrights Credits: 3
- THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3
- THR 480 - Advanced Playwriting Credits: 3
- THR 482 - Advanced Screenplay Workshop Credits: 3
- THR 484 - Translation & Adaptation for Stage & Screen Credits: 3
- THR 491 - Major's Seminar on the Profession Credits: 3
- THR 496 - Text in Production Credits: 3

May be applied to the appropriate area:

- THR 490 - Special Topics in Drama Credits: 1-6
- THR 494 - Field Experience Credits: 1-6
- THR 497 - Independent Study Credits: 1-6

Theater Concentrations (30-39 credits)

Theater majors may apply to complete their degree in one of the following concentrations: Design and Technical Theater, Performance (Acting and Directing), Playwriting and Dramaturgy, Theater Studies, or Teaching Theatre Arts PK-12.

Theater majors are not required to complete a concentration to graduate with a Theater BA.

Information about the concentration application process can be found on the department web page, theater.gmu.edu, or by calling the department office at 703-993-1120.

Please see the concentration advisor in your area of interest for specific application details.

To graduate with a concentration, student must have a minimum cumulative program GPA of 3.0.

**Concentration in Design and Technical Theater (DTT)**

The Design and Technical Theater concentration provides a foundation of knowledge, technique, and experience in one or more areas of theater design and technology in preparation for advanced study and professional work in the field.

Synthesis fulfilled by THR 440 or THR 496

Prerequisites to apply: THR 198, 199, 230, and 9 additional THR credits

**Required Core Courses:**

- THR 314 - Lighting Stagecraft Credits: 3
- THR 331 - Drafting and Model Making Credits: 3
- THR 332 - Seminar in Costume History Credits: 3
- THR 339 - Theatrical Design Concepts Credits: 3
- THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3 or THR 496 - Text in Production Credits: 3
- THR 495 - Senior Capstone Project Credits: 3

Design Courses

Take two design courses:

- THR 333 - Stage Design Credits: 3
- THR 334 - Lighting Design Credits: 3
- THR 335 - Costume Design Credits: 3
- THR 337 - Sound Design Credits: 3

Design and Technical Theater Concentration Electives:

Select four courses from (maximum of 6 credits of THR 330 and maximum of 3 credits of THR 494):

- THR 315 - Sound Engineering Credits: 3
- THR 330 - Seminar in Technical Theater Credits: 3
- THR 336 - Advanced Theater Technology Credits: 3
- THR 342 - Makeup Design Credits: 3
- THR 343 - Costume Draping and Drafting Credits: 3
- THR 345 - Puppetry: History and Technique Credits: 2-4
- THR 434 - Advanced Lighting Design Credits: 3
- THR 494 - Field Experience Credits: 1-6

Total: 36 credits

▲ Concentration in Performance (PFM)

This area is designed for the serious student of acting and directing with professional aspirations. Solid grounding in the fundamentals of performance analysis and basic training of the actor's instrument are complemented by a rigorous, sequential instruction in the various facets of the actor's craft.

At its core, the Performance Concentration is a blend of Modern and Classical actor training using a Stanislavski-grounded approach balanced with techniques for understanding texts written two hundred years before "motivation" and "characterization" entered the critical vocabulary. Rounding out the curriculum is specialized study in vocal production and movement technique. Matriculation in this program expresses a profound commitment to a rigorous intellectual, physical and emotional investigation of the discipline of performance over a two-year period. Professional development is enhanced with ongoing student progress reviews, support and advising from Performance Concentration faculty.

Synthesis fulfilled by THR 440 or THR 496

Prerequisites to apply: THR 210, 310, 329, and 3 additional THR credits

Required Core Courses:
- THR 300 - Voice and Speech I Credits: 3
- THR 303 - Movement for the Actor I Credits: 3
- THR 320 - Beginning Modern Acting Credits: 3
- THR 321 - Acting Shakespeare Credits: 3
- THR 340 - Directing II Credits: 3
- THR 365 - Characterization Credits: 3
- THR 420 - Advanced Modern Acting Credits: 3
- THR 421 - One-Person Show Credits: 3
- THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3 or THR 496 - Text in Production Credits: 3

Performance Concentration Electives

Select four courses from the following:

- THR 301 - Voice and Speech II Credits: 3
- THR 304 - Movement for the Actor II Credits: 3
- THR 305 - Stage Combat Credits: 3
- THR 423 - Audition Techniques: Stage and Camera Credits: 3
- THR 425 - Verse Speaking Credits: 3
- THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3
- THR 490 - Special Topics in Drama Credits: 1-6
- THR 494 - Field Experience Credits: 1-6
- THR 496 - Text in Production Credits: 3
- THR 497 - Independent Study Credits: 1-6

Total: 39 credits

▲ Concentration in Playwriting and Dramaturgy (PWD)

The Playwriting and Dramaturgy concentration acknowledges a creative and practical connection between the work of the playwright and dramaturg. Students choosing this area of specialization will focus on the literary aspects of theater, such as playwriting, dramaturgy, screenwriting, translation, adaptation, season planning, and theater criticism. Students seeking specialized experience as a playwright or dramaturg will choose from a selection of required and recommended courses designed to expose students to a broad range of contemporary and classical texts, deepen their understanding of dramatic structure, encourage collaboration, and foster opportunities for new play development. Students are encouraged to consult their advisors on complementary courses of interest outside the major, such as in the visual and performing arts, Film and Video Studies, English and Foreign Language. This concentration gives students access to a variety of hands-on opportunities within the Department and the professional world.

Synthesis fulfilled by THR 440

Prerequisites to apply: THR 150 or 151 and 9 additional THR credits

Required Core Courses:

- THR 352 - Dramatic Literature Seminar Credits: 3
• THR 380 - Playwriting I Credits: 3
• THR 381 - Playwriting II Credits: 3
• THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3
• THR 484 - Translation & Adaptation for Stage & Screen Credits: 3
• THR 495 - Senior Capstone Project Credits: 3

Playwriting and Dramaturgy Concentration Electives:

Take four courses from the following:

• THR 340 - Directing II Credits: 3
• THR 352 - Dramatic Literature Seminar Credits: 3
• THR 355 - Moral Vision in American Theater Credits: 3
• THR 359 - World Stages Credits: 3
• THR 382 - Screenplay Workshop Credits: 3
• THR 395 - Theater as the Life of the Mind Credits: 3
• THR 421 - One-Person Show Credits: 3
• THR 424 - Contemporary Women Playwrights Credits: 3
• THR 480 - Advanced Playwriting Credits: 3
• THR 482 - Advanced Screenplay Workshop Credits: 3
• THR 490 - Special Topics in Drama Credits: 1-6

Total: 30 credits

▲ Concentration in Teaching Theatre Arts PK-12 (THRA)

This concentration is designed for students interested in pursuing theater education. In addition to transcript review and the submission of an essay detailing goals for the concentration, students must:

• Have earned 45 to 60 credits.
• Submit scores for the Praxis I (Reading, Writing, and Mathematics) tests to the committee. (It is strongly recommended that students take the Praxis I tests as soon as ENGH 302, a course in literature, and a course in mathematics have been completed.)
• Maintain an overall GPA of 2.80 in all course work completed at Mason and in course work at all institutions of higher learning combined.
• Earn no grade lower than a C in theater and professional education courses needed for graduation.

Upon fulfilling THR 448, 449, 450, 451, EDRD 300, EDUC 301, and EDUC 302 students must complete 15 weeks of a full-time student teaching internship (THR 455). Applications for placement, subject to approval of the unit, are submitted to the Field Placement Specialist in the College of Education and Human Development at the beginning of the previous semester. In addition, students must pass the VCLA before student teaching.

Required Core Courses:

• THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3 or THR 496 - Text in Production Credits: 3 (fulfills synthesis requirement)
• THR 448 - Teaching Theater Credits: 3 or EDUC 422 - Foundations of Secondary Education Credits: 3 or EDUC 521 - Foundations of Education, PK-12 Credits: 3
• THR 449 - Elementary Theater Education Credits: 3
• THR 450 - Secondary Theater Education Credits: 3
• THR 451 - Theater Pedagogy Credits: 3
• EDRD 300 - Literacy and Curriculum Integration Credits: 3
• EDUC 301 - Educationally Diverse Populations: Handicapped, Gifted, Multicultural Credits: 3
• EDUC 302 - Human Growth and Development Credits: 3 or EDUC 539 - Human Development and Learning PK-12 Credits: 3
• THR 455 - Practical Teaching Experience Credits: 3-6

Teaching Theatre Arts PK-12 Concentration Electives (12 credits)

Four courses from Theater Performance Area or four courses from Theater Design and Technical Area.

Total: 39 credits

▲ Concentration in Theater Studies (THST)

This concentration is designed to provide the theater generalist with a thorough preparation for further study and work in directing, scholarship or arts management.

Synthesis fulfilled by THR 440 or THR 496

Prerequisites to apply: THR 198 or 199, 150 or 151, 210 and 230

Required Core Courses:

• THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3 or THR 496 - Text in Production Credits: 3 (fulfills synthesis requirement)
• THR 494 - Field Experience Credits: 1-6 (Must be taken for 3 credits)
• THR 495 - Senior Capstone Project Credits: 3

Theater Studies Concentration Electives:

Select three of the following courses:

• THR 351 - Dramatic Theory and Criticism Credits: 3
• THR 352 - Dramatic Literature Seminar Credits: 3
• THR 355 - Moral Vision in American Theater Credits: 3
• THR 359 - World Stages Credits: 3
• THR 380 - Playwriting I Credits: 3
• THR 382 - Screenplay Workshop Credits: 3
• THR 395 - Theater as the Life of the Mind Credits: 3
• THR 424 - Contemporary Women Playwrights Credits: 3
Theater Elective:

Select one course from the following:

- THR 310 - Acting II Credits: 3
- THR 340 - Directing II Credits: 3
- THR 381 - Playwriting II Credits: 3
- THR 482 - Advanced Screenplay Workshop Credits: 3

Design Elective:

Select one course from the following:

- THR 333 - Stage Design Credits: 3
- THR 334 - Lighting Design Credits: 3
- THR 335 - Costume Design Credits: 3
- THR 337 - Sound Design Credits: 3
- THR 342 - Makeup Design Credits: 3

Theater Studies Electives:

THR 300-499 (9 credits)

Total: 33 credits

Electives

- Electives (2-24 credits)

Total: 120 credits

Theater, BFA

Banner Code: AR-BFA-THR

Performing Arts Building, Room A407
Phone: 703-993-1120
Web: theater.gmu.edu

Faculty

Ken Elston, Chair
Professors: D’Andrea (Robinson Professor), Davis, McDonald

Associate Professors: Austin, Elston, Gero, Johnsen-Neshati, Kurtz

Term Associate Professor: Chew

Adjunct Faculty: Cadby, Cetron, Dunayer, Gaines, Lechter, Lee, Maier, McManus, Mountain, Murray, Nanni-Messegee, Wallace

Program

Entrance into the BFA program is by interview and audition or portfolio review. Information about the audition, portfolio review and interview process; including dates; can be found on the department web page, theater.gmu.edu/admissions, or by calling the department office at 703-993-1120. Admission to the University is determined by the Admissions Office.

In addition to the general education requirements for the Bachelor of Arts degree, Theater Bachelor of Fine Arts majors must complete a minimum of 80 hours in the major: 32 hours of required Theater core courses plus 48 hours in the concentration. Concentrations are: Design for Stage and Screen, Performance for Stage and Screen (Acting and Directing), Writing and Dramaturgy for Stage and Screen.

Theater majors are expected to participate in Theater at Mason productions and will be required to demonstrate growing proficiency in their chosen concentration prior to the confirmation of the BFA degree.

Writing-Intensive Requirement

The university requires all students to complete at least one course designated writing-intensive in their majors at the 300 level or above. Students seeking a BA in theater fulfill this requirement by successfully completing THR 350 or THR 482.

Course Work

The Theater Department offers all course work designated THR in the Courses chapter of this catalog.

Production Opportunities

Participation in Theater at Mason productions is expected of all declared majors.

All Theater majors must enroll in THR 191 each semester. It is a zero (0) credit class, graded S/NC, that is successfully completed by attending productions, guest lectures, and/or workshops; participating in production load-in; and participating in production strike.

Students must also earn four (4) practicum credits: one (1) credit for satisfactory completion (a minimum of 30 hours) of each of four (4) performance and production assignments in the major, including faculty or guest-directed Mason Players Mainstage and student-directed Studio productions.

All freshmen, first year transfer, and all new Theater majors will be assigned one (1) THR 198 credit and one (1) THR 199 credit during their first academic year.

Assignments for THR 196 and THR 197 will include a presentation of portfolio documents demonstrating a practical analysis of the role, design, or support position to subject area mentors.

- THR 196 assignments including actor, designer, assistant designer, stage manager, and assistant stage manager.
THR 197 assignments include director, assistant director, dramaturg, master electrician, technical director, playwright, house management, and publicity.

THR 198 assignments include scenery construction and painting, costume construction, electrician, and props.

THR 199 assignments include stage crew, light board operator, sound board operator, wardrobe, and fly crew.

Unless registered for a Theater course approved as directly connected to production (i.e. THR 196-199, 492 or 495) all students (including non-Theater majors) electing to participate in a Theater at Mason production must register for THR 200 concurrent with participation.

**Theater Honors Program**

Highly qualified students who have completed 75 credits may pursue advanced work leading to graduation with honors in the major. Students apply for Honors in Theater by submitting to the Chair (by November 15 or April 15) a two-page written statement outlining their reasons for pursuing advanced coursework and specific professional goals, along with the names of two Mason theater faculty members who have agreed to serve as references.

Students satisfy the honors course sequence by taking three Honors specific courses from their chosen concentration. They must also maintain an overall GPA of 3.5 and a GPA of 3.75 within the major.

**Academic Policies**

Please see College of Visual and Performing Arts academic policies.

**General Education (40 credits)**

**Foundation Requirements**

- Oral communication Credits: 3
- Information Technology Credits: 3 (Design for Stage and Screen concentration requires AVT 180 and an ethics course)
- Quantitative reasoning Credits: 3
- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3

Nonnative speakers of English with limited proficiency in the language may substitute ENGH 100 for ENGH 101. Students must attain a minimum grade of C in ENGH 100 or 101, as well as 302, to fulfill degree requirements.

**Core Requirements**

- Literature Credits: 3
- Arts Credits: 3
- Natural science (including one laboratory science) Credits: 7
- Western civilization Credits: 3
- THR 359 - World Stages (Global understanding) Credits: 3
- Social and behavioral sciences Credits: 3
- THR 440 - Advanced Studies in Directing/Dramaturgy or THR 496 - Text in Production (Synthesis) (Writing and Dramaturgy for Stage and Screen Concentration requires THR 440) Credits: 3
Major (80 credits)

Theater Core Requirements (32 credits)

- THR 150 - Drama, Stage, and Society I Credits: 3
- THR 151 - Drama, Stage, and Society II Credits: 3
- THR 191 - Practical Theater Seminar Credits: 0 (Must be taken each semester registered up to a maximum of 12 semesters)
- THR 196 - Performance and Design Practicum Credits: 1
- THR 197 - Management/Literary Practicum Credits: 1
- THR 198 - Theatrical Construction Practicum Credits: 1
- THR 199 - Production Run Crew Practicum Credits: 1
- THR 210 - Acting I Credits: 3
- THR 230 - Introduction to Technical Theater Credits: 3
- THR 350 - Script Analysis Credits: 3
- THR 411 - Directing on Screen Credits: 3 or THR 412 - Performance on Screen Credits: 3
- THR 493 - Collaborative Lab Experience Credits: 3
- THR 494 - Field Experience Credits: 1-6 (Must be taken for 3 credits)

One upper-level dramatic literature course (3 credits)

- THR 351 - Dramatic Theory and Criticism Credits: 3
- THR 352 - Dramatic Literature Seminar Credits: 3 (required for Writing/Dramaturgy)
- THR 355 - Moral Vision in American Theater Credits: 3
- THR 395 - Theater as the Life of the Mind Credits: 3
- THR 424 - Contemporary Women Playwrights Credits: 3

A 1-credit minicourse:

- THR 201 - Stage Management Credits: 1
- THR 202 - Literary Management Credits: 1 (Required for Writing/Dramaturgy)
- THR 203 - Production/Company Management Credits: 1

Theater BFA Concentrations (48 credits)

Theater majors earning a BFA in Theater must select one of the following concentrations: Design for Stage and Screen, Performance for Stage and Screen (Acting and Directing), or Writing and Dramaturgy for Stage and Screen
Design for Stage and Screen Concentration (DSS)

Required Core Courses

- Information Technology Ethics requirement (see University General Education for course offerings) Credits: 1
- AVT 280 - Introduction to New Media Arts Credits: 4
- THR 332 - Seminar in Costume History Credits: 3
- THR 339 - Theatrical Design Concepts Credits: 3
- THR 495 - Senior Capstone Project Credits: 3

Concentration Electives

6 credits from the following:
- THR 314 - Lighting Stagecraft Credits: 3
- THR 315 - Sound Engineering Credits: 3
- THR 331 - Drafting and Model Making Credits: 3
- THR 343 - Costume Draping and Drafting Credits: 3

6 credits from the following:
- FAVS 335 - Sound and Lighting for Film and Video Credits: 3 (COMM 355 prerequisite)
- MUSI 301 - Music in Motion Pictures Credits: 3
- THR 333 - Stage Design Credits: 3
- THR 334 - Lighting Design Credits: 3
- THR 335 - Costume Design Credits: 3
- THR 337 - Sound Design Credits: 3

12 credits from the following*:
- AVT 374 - Sound Art I Credits: 4
- THR 330 - Seminar in Technical Theater Credits: 3
- THR 336 - Advanced Theater Technology Credits: 3
- THR 342 - Makeup Design Credits: 3
- THR 343 - Costume Draping and Drafting Credits: 3
- THR 434 - Advanced Lighting Design Credits: 3

7-8 credits from the following*:
- AVT 204 - Visual Thinking Credits: 3
- AVT 252 - Fundamentals of Photography Credits: 4
- AVT 353 - Traditional Photo Methods Credits: 4
- AVT 354 - Digital Photo Techniques Credits: 4
- AVT 382 - 2D Experimental Animation Credits: 4
- AVT 383 - 3D Experimental Animation Credits: 4
- AVT 390 - Video Art Credits: 4

* AVT course work may not exceed 20 credits

General Electives (2-3 credits)
Performance for Stage and Screen (Acting and Directing) Concentration (PSS)

Required Core Courses

- THR 300 - Voice and Speech I Credits: 3
- THR 303 - Movement for the Actor I Credits: 3
- THR 310 - Acting II Credits: 3
- THR 320 - Beginning Modern Acting Credits: 3
- THR 321 - Acting Shakespeare Credits: 3
- THR 329 - Directing I Credits: 3
- THR 365 - Characterization Credits: 3
- THR 410 - Screen Acting Credits: 3
- THR 420 - Advanced Modern Acting Credits: 3
- THR 421 - One-Person Show Credits: 3
- THR 423 - Audition Techniques: Stage and Camera Credits: 3
- THR 425 - Verse Speaking Credits: 3

Concentration Electives

12 credits from the following:

- AVT 204 - Visual Thinking Credits: 3
- AVT 272 - Interdisciplinary Arts Credits: 4
- AVT 393 - Field Experience in the Arts Credits: 1-6
- THR 301 - Voice and Speech II Credits: 3
- THR 304 - Movement for the Actor II Credits: 3
- THR 305 - Stage Combat Credits: 3
- THR 340 - Directing II Credits: 3
- THR 342 - Makeup Design Credits: 3
- THR 440 - Advanced Studies in Directing/Dramaturgy Credits: 3
- THR 490 - Special Topics in Drama Credits: 1-6 (upon approval from advisor)
- THR 496 - Text in Production Credits: 3
- THR 497 - Independent Study Credits: 1-6

Writing and Dramaturgy for Stage and Screen Concentration (WDSS)

Required Core Courses
• ENGH 372 - Introduction to Film Credits: 3
• THR 329 - Directing I Credits: 3
• THR 352 - Dramatic Literature Seminar Credits: 3
• THR 380 - Playwriting I Credits: 3
• THR 381 - Playwriting II Credits: 3 or THR 382 - Screenplay Workshop Credits: 3
• THR 382 - Advanced Screenplay Workshop Credits: 3
• THR 484 - Translation & Adaptation for Stage & Screen Credits: 3

Concentration Electives

15 credits from the following:
• FAVS 483 - Feature-Length Scriptwriting Credits: 3
• THR 340 - Directing II Credits: 3
• THR 352 - Dramatic Literature Seminar Credits: 3
• THR 355 - Moral Vision in American Theater Credits: 3
• THR 359 - World Stages Credits: 3
• THR 395 - Theater as the Life of the Mind Credits: 3
• THR 424 - Contemporary Women Playwrights Credits: 3
• THR 480 - Advanced Playwriting Credits: 3
• THR 490 - Special Topics in Drama Credits: 1-6 (upon approval from advisor)

6 credits from the following:
• CHIN 320 - Contemporary Chinese Film Credits: 3
• FREN 470 - French and Francophone Cinema Credits: 3
• JAPA 320 - Japanese Cinema Credits: 3
• RUSS 470 - Topics in (Post) Soviet Film Credits: 3
• or other foreign film option as approved by advisor (3 credits)

3 credits from the following:
• THR 365 - Characterization Credits: 3
• THR 421 - One-Person Show Credits: 3

3 credits from the following:
• THR 495 - Senior Capstone Project Credits: 3
• THR 496 - Text in Production Credits: 3

Total: 120 credits

Undergraduate Minor

Theater Minor
University policy states that students must earn 8 distinct credits that are not used for their major toward their degree.

**Course Work**

The theater minor consists of 18 credits in theater, selected in consultation with a faculty advisor and approved by the department chair.

**Total: 18 credits**

**Bachelor's/Accelerated Master's Program**

**Theater, BA/Arts Management, Accelerated MA**

**Faculty**

Ken Elston, Chair

**Professors:** D’Andrea (Robinson Professor), Davis, McDonald  
**Associate Professors:** Austin, Elston, Gero, Johnsen-Neshati, Kurtz  
**Term Associate Professor:** Chew  
**Adjunct Faculty:** Cadby, Cetron, Dunayer, Gaines, Lechter, Lee, Maier, McManus, Mountain, Murray, Nanni-Messegee, Wallace

**Program**

Undergraduates in Theater may apply to the accelerated master's degree in Arts Management. If accepted, students will be able to earn a BA in Theater and an MA in Arts Management after satisfactory completion of 150 credits. The regular designed timeframe would be a start in the Fall and the completion in the Summer five years later, but longer timeframes would also be available.

This program of study is offered through joint cooperation between the Theater Department and the Arts Management Program.

For policies governing all graduate degrees, see the Academic Policies chapter of the catalog.
Admission Requirements

Applicants to accelerated master's programs must have completed at least 75 credits that apply to their undergraduate degree (with at least 24 credits at Mason) and no more than 90 credits. Applicants should submit an Accelerated Master's Program Application, available from the College of Visual and Performing Arts (CVPA) Graduate Studies. It includes the proposed conferral date for the undergraduate degree and the two graduate courses that are to be applied to the undergraduate degree.

Interested students should contact the Arts Management Program Office for more details about the application process.

Degree Requirements

As an undergraduate, the accelerated master's student is to complete the two graduate courses indicated on their Accelerated Master's Program with a minimum grade of 3.00 in each course. Students must maintain a minimum GPA of 3.00 in all coursework and in coursework applied to their major. On completion and conferral of the undergraduate degree in the semester indicated in the application, they submit the Bachelor's/Accelerated Master's Transition Form (which shall incorporate all of the Graduate Admission requirements of the University) and are admitted to graduate status.

As graduate students, accelerated master's students have an advanced standing. They must meet all master's degree requirements except for the two courses (6 credits) they completed as undergraduates. The Internal Internship (AMGT 740) will be within Theater at Mason (generally with the Theater Department). Students will begin their master's program in the semester immediately following conferral of the undergraduate degree, and they may also begin in the summer term.

Reserve Graduate Credit

Students may take up to 6 additional graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with permission of the Theater Department. Permission to take a graduate course for reserve graduate credit is normally granted only to Mason seniors within 15 hours of graduation and must be approved by the Dean's Office.

To apply these credits to the master's degree, students must request that the credits be moved from the undergraduate degree to the graduate degree using the Bachelor's/Accelerated Master's Transition Form.

Master's Level Certificate

Teaching Theatre PK-12 Graduate Certificate

Banner Code: AR-CERG-THRP

Performing Arts Building, Room A407
Phone: 703-993-1120
Web: theater.gmu.edu

Faculty

Ken Elston, Chair

Professors: D'Andrea (Robinson Professor), Davis, McDonald

Associate Professors: Austin, Elston, Gero, Johnsen-Neshati, Kurtz
Program

The Theater Department offers a graduate certificate program for Teaching Theatre PK-12. To apply to the program, candidates must meet the following prerequisites:

Completed a major in theater or 33 semester hours distributed among the following areas:

- Directing: 6 semester hours
- Technical theater: 9 semester hours
- Cultural context and theater history: 3 semester hours
- Performance: 6 semester hours
- Dramatic literature: 9 semester hours

Students who have completed ALL endorsements, including Praxis I, are eligible for enrollment into the Graduate Certificate Program for Teaching Theatre PK-12. This certificate can be earned on a full time or part time basis. All Virginia requirements must be met to achieve licensure.

Licensure Program Requirements

- THR 548 - Theater Teaching Foundations Credits: 3 or EDUC 521 - Foundations of Education, PK-12 Credits: 3
- EDRD 501 - Literacy and Curriculum Integration, PK-12 Credits: 3
- EDUC 539 - Human Development and Learning PK-12 Credits: 3
- THR 549 - Advanced Elementary Theater Ed Credits: 3
- THR 550 - Advanced Secondary Education Credits: 3
- 6 credits of THR 555 - Practical Teaching Experience Credits: 3-6 (prior to internship, must pass: VCLA, technology & child abuse standards)

Total: 21 credits
Volgenau School of Engineering

Volgenau School of Engineering

Graduate Admissions: 703-993-1512
Graduate Student Services: 703-993-1505
Undergraduate Student Services: 703-993-1511
Web: volgenau.gmu.edu
College Code: VS

Administrative Units

Applied Information Technology (AIT)
Bioengineering (BENG)
Civil, Environmental, and Infrastructure Engineering (CEIE)
Computer Science (CS)
Electrical and Computer Engineering (ECE)
Statistics (STAT)
Systems Engineering and Operations Research (SEOR)

School Mission, Goals

The mission of the Volgenau School of Engineering is to provide our students with a high-quality education that emphasizes the importance of ethical behavior, integrity, and entrepreneurship. In addition, the School seeks to develop and disseminate leading-edge research that significantly advances the field of knowledge.

The Volgenau School of Engineering is concerned primarily with study areas that involve integrating the information basis for modern engineering with the more conventional physical and materials science approach. The careful integration of these areas results in a unique academic experience for highly motivated students.

The Volgenau School offers degree programs that concentrate on important contemporary technological issues and needs. Bachelor’s degree programs are offered in the areas of applied computer science, bioengineering, civil and infrastructure engineering, computer engineering, computer science, electrical engineering, applied information technology, and systems engineering. Minors in information technology, computer science, software engineering, data analysis, and systems engineering and operations research are also available.

Master’s degree programs are available in the following areas: applied information technology, civil and infrastructure engineering, geotechnical construction and structural engineering, computer
engineering, computer forensics, computer science, electrical engineering, information security and assurance, information systems, operations research, software engineering, statistical science, systems engineering, telecommunications and an interdisciplinary program in management of secure information systems. Several doctoral programs are offered, including a cross-disciplinary program in information technology and more focused programs in civil and infrastructure engineering, computer science, electrical and computer engineering, systems engineering and operations research, and statistical science. In addition, the engineer degree in information technology provides post-master's training in an application area.

The undergraduate degree programs prepare students to enter directly into professional employment or continue studies at the graduate level. The requirements for the bachelor’s degrees include required and elective courses in mathematics, humanities, and general education, and specialty courses in applied computer science, bioengineering, civil and infrastructure engineering, computer engineering, computer science, electrical engineering, information technology, and systems engineering. Each program strongly emphasizes English composition and communication.

Students also have opportunities to develop interest areas in other fields within the Volgenau School that offer undergraduate courses but do not have undergraduate majors.

Administration

Kenneth Ball, Dean  
Stephen Nash, Senior Associate Dean  
Sharon Caraballo, Associate Dean for Undergraduate Programs  
Jennifer Lamb, Associate Dean for Development  
Melinda Barnhart, Executive Director, Finance and Administration  
Pete Farrell, Director, Alumni Relations  
Jonathan Goldman, Director, Computing Resources  
Linda Kovac, Director, Corporate Relations  
Terri Mancini, Director, Sponsored Research Administration  
Lisa Nolder, Director, Graduate Student Services  
Jade Perez, Director, Graduate Admissions and Enrollment Management

Bachelor of Science Programs

The Volgenau School offers eight Bachelor of Science programs in its academic units. Policies regarding admission and degree requirements specific to these majors are provided in the department sections that follow.

<table>
<thead>
<tr>
<th>BS Degree</th>
<th>Department</th>
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<tbody>
<tr>
<td>Applied Computer Science</td>
<td>CS</td>
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<tr>
<td>Applied Information Technology</td>
<td>AIT</td>
</tr>
<tr>
<td>Bioengineering</td>
<td>BENG</td>
</tr>
<tr>
<td>Civil and Infrastructure Engineering</td>
<td>CEIE</td>
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<tr>
<td>Computer Engineering</td>
<td>ECE</td>
</tr>
</tbody>
</table>
Undergraduate Mission, Goals

The undergraduate mission is to provide a quality education to support the needs of Virginia and the nation. The goal is to graduate students who are technically competent; prepared for ethical professional practice and a lifetime of learning; communicate effectively and work as members or leaders of technical teams; and understand the global nature and effect of information technology and engineering.

Degree Requirements

The following general requirements must be completed by all undergraduate students:

- At least 120 credits of academic work including at least 45 credits of upper-level courses (numbered 300 or above)
- At least 6 credits of English composition, 3 credits of literature, and 3 credits of oral communication (university general education electives)
- At least 3 credits of arts, 3 credits of Western civilization, 3 credits of social and behavioral science, and 3 credits of global understanding issues (university general education electives)
- At least 24 credits of social science and humanities course work, which is normally satisfied by the 24 credits of university general education courses described above
- All requirements listed in the following sections for specific Volgenau School majors, including university requirements for mathematics, natural science, information technology competency and ethics, and synthesis. Sample schedules that fulfill degree requirements for individual programs within the Volgenau School are available from the departments. With approval of department advisors, some courses may be taken out of the indicated sequences, particularly English, literature and social science courses.

Termination from the Major

No math, science, or Volgenau School of Engineering course that is required for the major may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Sample Schedules

Sample schedules that fulfill degree requirements for individual programs within the Volgenau School are available from the departments and in the program section of this catalog.

Undeclared Students in the Volgenau School of Engineering

Freshmen who are undecided about their specific major may select Volgenau School undeclared as their major. This should be done as soon as possible after a student enrolls at George Mason. Such students then will be assigned to one of the Volgenau School Departments for advising until the student decides on a final major. These students should go to their assigned Department for advising when needed or at least each semester. The student will be advised to follow an initial semester or two of courses that could be applicable to majors that are of interest to them. This may involve taking courses that help the student better understand different engineering areas, but which may not contribute towards the 120 credits needed for the major in which they finally decide.
Academic Policies

Students should become familiar with the University's general academic policies in addition to those specific to each academic unit. Please see the Academic Policies section of the catalog, which also lists additional university requirements for minor programs and double majors.

Academic Appeal of Policies, Grades and Actions

In most instances, the student's instructor, academic advisor and/or department can resolve most academic-related issues that arise from time to time in a manner that student, instructor, academic advisor and/or department find acceptable. If, however, the student disagrees with a decision at the department level and feels that there may be reasonable grounds for appeal, the student should contact the Volgenau School Student Services Offices at 703-993-1511. This office is staffed with student services professionals who can provide guidance in preparing a request to the appropriate dean and higher levels if necessary.

Academic Progression

Students majoring in the Volgenau School programs are expected to have an acceptable plan of study on file, formulated with assistance from the department advisor. They are expected to make reasonable progress toward their degree during each semester they are enrolled. Individual Volgenau School programs may not allow students to retake certain high-demand courses in which they have already earned a grade of C or better if they want to retake the course to improve their GPA.

Restricted Courses

Students are encouraged to take advantage of the many excellent courses available to broaden their educational experience or strengthen their background; however, some credits earned may not satisfy any degree requirements. Degree requirements for the Volgenau School undergraduate programs may not include credits earned in activity courses in any department. Examples include many of the courses listed under the catalog designations of art, dance, music, or theater; individual sports, physical education, or team sports; and recreational activities. Exceptions in these categories are courses that meet the university general education requirements for the major, including global understanding or arts. Whenever there is uncertainty, students must consult with an academic advisor in their department. Generally, degree requirements for computer science and engineering majors may not be met by 100- to 400-level courses designated “IT” (and any associated cross-listed courses) in the Course Descriptions chapter of this catalog unless approved by the student's major department. For more information, students should contact their academic advisor.

Writing-Intensive Requirement

The university requires all undergraduate students to successfully complete a course, or combination of courses, designated “writing-intensive” in their majors at the 300 level or above. To determine the writing-intensive course requirements for specific degrees, refer to the major program descriptions in the following department sections.

BS/Accelerated MS Programs

Many of the BS degree programs offered within the Volgenau School may be packaged with some of the MS degree programs in ways that reduce the total number of credits required. Details may be found in the individual department sections.

Master of Science Programs

Degree Requirements
The Volgenau School offers a number of Master of Science programs to include a Master of Engineering program and an Interdisciplinary Master of Science program with the School of Management. Policies regarding admission and degree requirements are provided in the department sections that follow.

### MS Degree

<table>
<thead>
<tr>
<th>Department</th>
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<tbody>
<tr>
<td>Applied Information Technology</td>
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<tr>
<td>Civil and Infrastructure Engineering</td>
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<tr>
<td>Computer Engineering</td>
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<tr>
<td>Computer Forensics</td>
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<tr>
<td>Computer Science</td>
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<tr>
<td>Electrical Engineering</td>
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<tr>
<td>Geotechnical, Construction, and Structural Engineering, MEng</td>
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<tr>
<td>Information Security and Assurance</td>
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<tr>
<td>Information Systems</td>
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<tr>
<td>Management of Secure Information Systems</td>
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<td>Operations Research</td>
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<tr>
<td>Software Engineering</td>
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<td>Statistical Science</td>
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<tr>
<td>Systems Engineering</td>
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<td>Telecommunications</td>
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</table>

### Doctor of Philosophy Programs

The Volgenau School offers six PhD programs within its academic units. Policies regarding admission and degree requirements are provided in the department sections that follow with the exception of the Information Technology PhD program. The PhD in information technology is a program that builds on a fundamental core and emphasizes cross-disciplinary efforts among the master’s programs in the Volgenau School, as well as with related units at Mason. Specific entrance and degree requirements for this doctoral program are found in the Interdisciplinary Programs section of this chapter.

<table>
<thead>
<tr>
<th>Department</th>
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<tbody>
<tr>
<td>Civil and Infrastructure Engineering</td>
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<tr>
<td>Computer Science</td>
</tr>
<tr>
<td>Electrical and Computer Engineering</td>
</tr>
<tr>
<td>Information Technology</td>
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</tbody>
</table>

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Engineer Degree in Information Technology

The engineer degree is a post-master’s degree, but it does not confer a doctorate. Students pursuing the engineer degree can take advanced PhD courses and complete a project of an applied nature to fulfill program requirements. Details about the engineer degree can be found in the Interdisciplinary Programs section of this chapter.

Distance Education Programs

In order to increase access to Volgenau School education and to meet the needs of the School’s student population, a number of individual courses and select degree programs can be completed via distance education. Please contact the individual departments for details. All academic policies and procedures apply to distance education programs and courses; see the appropriate sections of this catalog. Some instructors may require students to come to campus or make alternate arrangements for exams and/or other meetings. Students should contact the instructor directly to resolve any questions. For distance education courses which involve live online transmission of simultaneous classroom instruction, students in the distance section may also be permitted to join the campus-based section in the classroom; Patriot Web will state if this option is available for a particular distance education section.

Commonwealth Graduate Engineering Program

The Commonwealth Graduate Engineering Program (CGEP) is a cooperative program of Mason, the University of Virginia (UVA), Virginia Tech, Old Dominion University (ODU), and Virginia Commonwealth University (VCU) designed to make graduate engineering education available in locations throughout Virginia through distance learning. CGEP offers graduate degree programs in engineering and information technology. Instruction takes place through a mix of videoconferencing and web-based courses available at educational and corporate receive sites around the state.

Each degree program is taught by one of the five participating universities, and prospective students should apply directly to the university offering the degree of interest. Mason’s Master of Science in computer science degree is available through CGEP. This program follows all policies stated in this catalog for the MS in computer science, with the exception that, with faculty advisor approval, up to 50% of the required credits may be completed at other CGEP institutions. Courses from the other institutions may be offered at Mason’s Fairfax or Prince William campuses.

Policies for other universities’ programs are determined by those institutions; please consult with the university offering the program of interest for details.

For more information about CGEP, go to volgenau.gmu.edu/graduates/commonwealth_graduate_engineering.php.

Applied Information Technology

Phone: 703-993-3565
Web: ait.gmu.edu

School: Volgenau School of Engineering

Faculty
Professors: Gantz (chair), Jajodia

Associate professors: Bruno, Caraballo, Kang, Sanghera, Snow (associate chair)

Assistant professors: Aksoy, Albanese, Boicu, Rytikova, Wang D.

Instructors: D’Alessandro, Farrell, Garrison, Islam, Lyons, Quinn

Adjunct professors: Angelone, Ayehu, Berlin, Bucci, Butu, Caldwell, Camp, Curts, Durie, Fennell, Goodacre, Haliyur, Hsu, Jalinoos, Jalinos, Kahr, Karkehabadi, Latiff, Leary, Long, Lord, Luo, McLaughlin, Morikawa, Phung, Quinn, Reo, Sampson, Santucci, Schorling, Tenally, Tharp, Truong, West, Woodfork, Young, Zahadat, Ziman

Applied Information Technology offers undergraduate and graduate programs to develop expertise in applying information technology to support business applications. The programs emphasize problem-solving, communication, as well as technical and leadership skills.

The BS in Applied Information Technology program aims to meet the existing and emerging needs of industry by educating new IT workers in current principles and practices, and in its applications. The program focuses on equipping graduates with effective skills for interacting at the management level as well as the technical level. Graduates fill jobs that focus on the application of IT in an increasing number of emerging sub-disciplines, including network administration, information security, information systems, telecommunications, web development, and computer graphics.

The MS in AIT emphasizes elements of productive, effective and ethical leadership of major IT projects, in both the federal and private sectors.

The department also offers a certificate program for students seeking to add an AIT certification to their existing credentials. Students currently pursuing undergraduate degrees in other disciplines may choose to add a minor in AIT.

Course Work

The AIT Department offers all 100 - 400 IT courses and many 500/700 level AIT courses in the Courses chapter of this catalog.

Undergraduate Degree

Applied Information Technology, BS

Banner Code: VS-BS-AIT

School: Volgenau School of Engineering

Department: Applied Information Technology

The BS in applied information technology prepares students to apply IT to support business processes. The degree produces graduates with strong problem-solving, writing, and communication skills who successfully compete for technical employment and are prepared for advanced study. The objective of the degree is to provide students with the following:

- Fundamental knowledge regarding concepts, tools, and methods of IT, including the opportunity to learn appropriate conceptual and computational tools essential for a successful career
- A broad background across fundamental areas of IT along with a depth of understanding in a particular area of interest
- Skills for effective written and oral communication with technical and nontechnical people in the IT field and the chosen area of interest, as well as skills and strategies for facilitating group projects and activities
• Working knowledge of leading-edge technologies and advanced systems through computer laboratory courses
• Industry-validated curriculum that maintains currency with business needs
• Preparation for graduate studies in information security, information systems, telecommunications, and related IT areas
• Appreciation for the global influence of IT on society and an understanding of the ethical and social responsibilities of IT professionals

The BS in applied information technology aims to meet the existing and emerging needs of the IT industry by educating new IT workers in current principles and practices in IT and its applications. Graduates fill jobs that focus on the application of IT in an increasing number of emerging sub-disciplines, including network administration, information security, information systems, telecommunications, web development, and computer graphics.

This bachelor’s degree program is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org.

The program can be successfully completed in eight full-time semesters with an average of 15 credits each semester, as shown in the sample schedule below. It is also possible for students to complete the degree on a part-time basis. The 120-credit degree requirement consists of Mason general education requirements, IT foundation and core courses, and courses required for the chosen AIT concentration. At least 30 credits toward the BS degree must be earned at Mason, and at least 45 credits must be at or above the 300 level. Upper division courses in the program are taught at the Prince William campus where most AIT Department faculty offices are located.

Admission Requirements

Students who meet Mason’s general eligibility requirements may apply for admission to the AIT major. Admission is based on the appropriateness of the student’s academic objectives and the likelihood of the student benefiting from the program. Preference in admission is given to students who have four years of high school mathematics, including precalculus.

Degree Requirements

Students must fulfill all requirements for undergraduate programs. Requirements of the BS in Applied Information Technology degree include those of University General Education; of the AIT core, foundation, concentration, and capstone; and completion of a block of additional required courses.

Foundation Courses (18 credits)

• IT 101 - Introduction to Information Technology Credits: 3
• IT 103 - Introduction to Computing Credits: 3
• IT 106 - Introduction to IT Problem Solving Using Computer Programming Credits: 3
• IT 206 - Object Oriented Techniques for IT Problem Solving Using Computer Programming Credits: 3
• IT 212 - Computer Hardware Fundamentals Credits: 3
• STAT 250 - Introductory Statistics I Credits: 3

Core Courses (33 - 34 credits)

• IT 207 - Applied IT Programming Credits: 3
IT 213 - Multimedia and Web Design Credits: 3
IT 214 - Database Fundamentals Credits: 3
IT 223 - Information Security Fundamentals Credits: 3
IT 300 - Modern Telecommunications Credits: 3
IT 341 - Data Communications and Network Principles Credits: 3
IT 343 - IT Resources Planning Credits: 3
MSOM 300 - Managing Financial Resources Credits: 3
MSOM 301 - Managing People and Organizations Credits: 3
SYST 469 - Human Computer Interaction Credits: 3
IT 304 - IT in the Global Economy Credits: 3 OR BOTH CS 105 - Computer Ethics and Society Credits: 1 and CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3

Two-semester sequence of approved capstone design courses (7 credits)

- IT 492 - Senior Design Project I Credits: 3
- IT 493 - Senior Design Project II Credits: 4

Information Technology Concentrations (15 credits)

Students choose one of five concentrations from the list below. To fulfill the requirements for a concentration, students need 15 credits made up of four courses from their chosen concentration and a fifth course chosen from any of the five concentrations.

▲ Database Technology and Programming (DTP)

- IT 306 - Program Design and Data Structures Credits: 3
- IT 308 - Event-Driven Programming Credits: 3
- IT 314 - Database Management Credits: 3
- IT 315 - Mobile Development Credits: 3
- IT 344 - Information Storage and Management Technologies Credits: 3
- IT 414 - Database Administration Credits: 3

▲ Healthcare IT (HCIT)

- HAP 301 - Health Care Delivery in the United States Credits: 3
- HAP 360 - Introduction to Health Information Systems Credits: 3
- HAP 461 - Internet and Web Technology Applications for Healthcare Credits: 3
- IT 322 - Modern Data Warehousing and Visualization Credits: 3

▲ Information Security (INFS)
- IT 353 - Information Defense Technologies Credits: 3
- IT 357 - Computer Crime, Forensics, and Auditing Credits: 3
- IT 366 - Network Security I Credits: 3
- IT 462 - Information Security Principles Credits: 3
- IT 466 - Network Security II Credits: 3
- IT 467 - Network Defense Credits: 3

▲ Network and Telecommunications (NTEL)

- ECE 301 - Digital Electronics Credits: 3
- IT 342 - Operating Systems Fundamentals Credits: 3
- IT 348 - Cloud Computing Credits: 3
- IT 366 - Network Security I Credits: 3
- IT 441 - Network Servers and Infrastructures Credits: 3
- IT 445 - Advanced Networking Principles Credits: 3
- IT 455 - Wireless Communications and Networking Credits: 3
- IT 471 - Applications of Digital Technologies Credits: 3
- IT 481 - Concepts of Multimedia Processing and Transmission Credits: 3
- IT 484 - Voice Communications Technologies Credits: 3
- IT 488 - Fundamentals of Satellite Communications Credits: 3

▲ Web Development and Multimedia (WDM)

- IT 315 - Mobile Development Credits: 3
- IT 331 - Web I: Web Development Credits: 3
- IT 332 - Web Site Administration Credits: 3
- IT 335 - Web Development using Content Management Systems Credits: 3
- IT 413 - Digital Media Editing Credits: 3
- IT 415 - Information Visualization Credits: 3
- IT 431 - Web II: Advanced Web Development Credits: 3
- IT 435 - Applied Knowledge Technologies for the Semantic Web Credits: 3

Other Major Requirements (17 credits)

- Natural Science: 7 credits of natural science, including at least one 4-credit course with lab. Students should choose these from the list of courses approved for University General Education (these credits can also apply toward general education requirements).
- COMM 100 - Public Speaking Credits: 3
- IT 293 - Applied IT: Junior Transition Credits: 1
- MATH 108 - Introductory Calculus with Business Applications Credits: 3
- MATH 112 - Discrete Mathematics for IT Credits: 3
Additional University General Education (21 credits)

Students must complete all University General Education requirements not fulfilled by major requirements.

- Written Communication: 6 credits
- Literature: 3 credits
- Arts: 3 credits
- Western Civilization/World History: 3 credits
- Social and Behavioral Science: 3 credits
- Global Understanding: 3 credits

Electives (8 - 9 credits)

Students must complete additional coursework to bring their total number of credits to 120.

Sample Schedule

First Semester Credits: 15

- ENGH 101 - Composition Credits: 3
- HIST 100 - History of Western Civilization Credits: 3
- IT 101 - Introduction to Information Technology Credits: 3
- IT 103 - Introduction to Computing Credits: 3
- MATH 108 - Introductory Calculus with Business Applications Credits: 3

Second Semester Credits: 15

- Nonlab natural science (3)
- Literature (3)
- COMM 100 - Public Speaking Credits: 3
- IT 106 - Introduction to IT Problem Solving Using Computer Programming Credits: 3
- STAT 250 - Introductory Statistics I Credits: 3

Third Semester Credits: 16

- Natural science with lab (4)
- Social/behavioral science (3)
- IT 206 - Object Oriented Techniques for IT Problem Solving Credits: 3
- IT 212 - Computer Hardware Fundamentals Credits: 3
- IT 214 - Database Fundamentals Credits: 3
Fourth Semester Credits: 16

- Arts (3)
- IT 207 - Applied IT Programming Credits: 3
- IT 213 - Multimedia and Web Design Credits: 3
- IT 223 - Information Security Fundamentals Credits: 3
- IT 293 - Applied IT: Junior Transition Credits: 1
- MATH 112 - Discrete Mathematics for IT Credits: 3

Fifth Semester Credits: 15

- Elective (3)
- ENGH 302 - Advanced Composition Credits: 3 (Bus/Nat Sci/Tech)
- IT 341 - Data Communications and Network Principles Credits: 3
- MSOM 300 - Managing Financial Resources Credits: 3
- SYST 469 - Human Computer Interaction Credits: 3

Sixth Semester Credits: 15

- IT concentration course (3)
- IT 300 - Modern Telecommunications Credits: 3
- IT 304 - IT in the Global Economy Credits: 3
- IT 343 - IT Resources Planning Credits: 3
- MSOM 301 - Managing People and Organizations Credits: 3

Seventh Semester Credits: 15

- IT concentration course (3)
- IT concentration course (3)
- Global understanding (3)
- Elective (3)
- IT 492 - Senior Design Project I Credits: 3

Eighth Semester Credits: 13

- IT concentration course (3)
- IT concentration course (3)
- Elective (3)
- IT 493 - Senior Design Project II Credits: 4

Termination from the Major
No math, science, or Volgenau School of Engineering course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Writing-Intensive Requirement

The university writing-intensive requirement is satisfied by IT 343.

Grades

Students must have a C or better in any course that satisfies a prerequisite for an AIT course. To graduate with the BS in applied information technology, students must have a GPA of 2.50 or better across the IT foundation, core, capstone, and concentration courses.

Bachelor's Level Certificate

Information Technology Undergraduate Certificate

Banner Code: VS-CERB-INFT

School: Volgenau School of Engineering

Department: Applied Information Technology

This certificate is designed primarily for those students who have earned a nontechnical bachelor’s degree. It allows students with nontechnical backgrounds to augment the knowledge gained through their major-related courses with additional computer and IT knowledge, and skills to improve their attractiveness to employers in the high-technology community. This certificate requires a minimum of 24 credits, including 15 credits of core courses. Beyond these requirements, the student is free to define a technical focus area. The focus area must be composed of at least three courses (9 credits) approved by an IT Advisor.

Students pursuing only the undergraduate certificate in applied information technology will not maintain full-time status which requires a minimum of 12 credits per semester.

Certificate Requirements

Core Courses (15 credits)

- IT 101 - Introduction to Information Technology Credits: 3
- IT 103 - Introduction to Computing Credits: 3
- IT 106 - Introduction to IT Problem Solving Using Computer Programming Credits: 3

AND select two of the following:
• IT 206 - Object Oriented Techniques for IT Problem Solving Credits: 3
• IT 207 - Applied IT Programming Credits: 3
• IT 212 - Computer Hardware Fundamentals Credits: 3
• IT 213 - Multimedia and Web Design Credits: 3
• IT 214 - Database Fundamentals Credits: 3
• IT 223 - Information Security Fundamentals Credits: 3

Course Work

• Technical Focus Area  Credits: 9
Students must choose from the approved list of technical focus area courses.

Total: 24 Credits

Undergraduate Minor

Information Technology Minor

Banner Code: INFT

School: Volgenau School of Engineering

Department: Applied Information Technology

The minor is designed primarily for those non-Volgenau School majors who desire to augment the knowledge gained through their major-related courses with additional computer and IT knowledge. It also gives students the necessary skills to improve their attractiveness to employers in the high-technology community. The minor requires a minimum of 15 credits, including 9 credits of core courses. Beyond these requirements, the student is free to define a technical focus area, for example, information security. Focus areas are composed of at least two courses (6 credits). Students pursuing the IT minor should consult the list of approved Technical Focus area courses.

Minor Requirements

Core Courses (9 credits)

• IT 101 - Introduction to Information Technology Credits: 3
• IT 103 - Introduction to Computing Credits: 3
• IT 106 - Introduction to IT Problem Solving Using Computer Programming Credits: 3

Course Work
Bachelor's/Accelerated Master's Program

Applied Information Technology, BS/Applied Information Technology, Accelerated MS

Banner Code: AIT

School: The Volgenau School of Engineering
Department: Applied Information Technology

Admission Requirements

Students in the BS in Applied Information Technology Program may apply to this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. Criteria for admission are identical to criteria for admission to the MS program.

Degree Requirements

Students must complete all credits that satisfy requirements for the BS program and those for the MS program, with 6 credits overlapping with the following two courses:

- INFS 622 - Information Systems Analysis and Design Credits: 3
- GSOM 540 - Analysis of Financial Decisions Credits: 3

Degree Conferral

Students must apply to have the BS degree conferred the semester before they expect to complete the BS requirements. At the completion of MS requirements, a master's degree is conferred.

Applied Information Technology, BS/Computer Forensics, Accelerated MS

School: The Volgenau School of Engineering
Department: Applied Information Technology

Admission Requirements
Students in the BS in Applied Information Technology Program may apply for this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.25. Criteria for admission are identical to criteria for admission to the MS program.

Degree Requirements

Students must complete all credits that satisfy requirements for the BS program and those for the MS program, with 6 credits overlapping from two of the following courses:

- CFRS 500 - Introduction to Technologies of Forensics Value Credits: 3
- CFRS 510 - Digital Forensics Analysis Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3

Degree Conferral

Students must apply to have the BS degree conferred the semester before they expect to complete the BS requirements. At the completion of MS requirements, a master's degree is conferred.

Applied Information Technology, BS/Information Security and Assurance, Accelerated MS

School: Volgenau School of Engineering

Department: Applied Information Technology

This program is for students interested in immediately continuing on to graduate studies in information security and assurance.

Admission Requirements

Students in the BS in Applied Information Technology Program may apply for this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. Criteria for admission are identical to criteria for admission to the MS in Information Security and Assurance program.

Degree Requirements

Students must complete all credits that satisfy requirements for the BS program and those for the MS program, with 6 credits overlapping with:

- INFS 612 - Principles and Practices of Communication Networks Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3

Degree Conferral

Students must apply to have the BS degree conferred the semester before they expect to complete the BS requirements. At the completion of MS requirements, a master’s degree is granted.
Applied Information Technology, BS/Information Systems, Accelerated MS

School: Volgenau School of Engineering
Department: Applied Information Technology

This program is for students interested in immediately continuing on to graduate studies in information systems.

Admission Requirements

Students in the BS in Applied Information Technology Program may apply if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. Criteria for admission are identical to the criteria for admission to the MS in Information Systems program.

Degree Requirements

Students must complete all credits that satisfy requirements for the BS program as well as those for the MS program, with 6 credits overlapping with:

- INFS 614 - Database Management Credits: 3
- INFS 622 - Information Systems Analysis and Design Credits: 3

Degree Conferral

Students must apply to have the BS degree conferred the semester before they expect to complete the BS requirements. At the completion of MS requirements, a master’s degree is granted.

Applied Information Technology, BS/Software Engineering, Accelerated MS

School: Volgenau School of Engineering
Department: Applied Information Technology

This program is for students interested in immediately continuing on to graduate studies in software engineering.

Admission Requirements
Students in the BS in Applied Information Technology Program may apply to this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. Criteria for admission are identical to criteria for admission to the MS in Software Engineering program.

Degree Requirements

Students must complete all credits that satisfy requirements for the BS program and those for the MS in Software Engineering Program, with 6 credits overlapping with:

- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- SWE 622 - Distributed Software Engineering Credits: 3

Degree Conferral

Students must apply to have the BS degree conferred the semester before they expect to complete the BS requirements. At the completion of MS requirements, a master’s degree is granted.

Applied Information Technology, BS/Telecommunications, Accelerated MS

School: Volgenau School of Engineering

Department: Applied Information Technology

Students in the BS in Applied Information Technology program may elect to enter the Accelerated MS in Telecommunications (MS in TCOM) program while they are undergraduate students. The accelerated program is designed for qualified undergraduate students in the information technology program who would like to proceed directly into the MS in TCOM program, completing the two degrees with 144 credits.

Admission Requirements

Applicants must be Mason undergraduate students in the BS in Applied Information Technology program. Students may apply for the accelerated program during the semester after which they will have completed 90 or more credits applicable toward the BS degree. Students must have an overall GPA of at least 3.25 to apply for the program. Students who have not yet finished 90 credits may be accepted provisionally subject to satisfactory completion of 90 credits. Criteria for admission into the accelerated program are identical to criteria for admission into the MS in TCOM program, except that students do not need to have completed an undergraduate degree prior to admission.

Accepted students must maintain a minimum 3.25 GPA in the undergraduate segment of the accelerated program and a 3.00 GPA in the graduate segment. That is, after students have been accepted into the accelerated program, they must maintain a 3.25 GPA until they have satisfied requirements for the undergraduate degree.

Degree Requirements

Students must satisfy requirements for the undergraduate degree (120 credits) and the MS degree (30 credits), with 6 credits of overlap permitted. The MS in TCOM is on an accelerated track, with 6 credits taken as an undergraduate and 24 credits as a graduate student. The 6 undergraduate credits must be selected from those given in the listing that follows and will be substituted for BS degree concentration electives, subject to prior approval by an advisor.
Telecommunications courses:

- TCOM 500 - Modern Telecommunications Credits: 3
- TCOM 501 - Data Communications and Local Area Networks Credits: 1.5 (prerequisite: acceptance into the Accelerated BSIT/MS TCOM Program)
- TCOM 502 - Wide Area Networks and Internet Credits: 1.5 (prerequisites: TCOM 501, IT 341, or equivalent)
- TCOM 503 - Fiber Optic Communications Credits: 1.5 (prerequisite: TCOM 500 or equivalent)
- TCOM 504 - Asynchronous Transfer Mode Networks Credits: 1.5 (prerequisites: TCOM 501 and 502, IT 341, or equivalent)
- TCOM 505 - Networked Multicomputer Systems Credits: 1.5 (prerequisite: TCOM 501, IT 341, or equivalent)
- TCOM 509 - Internet Protocols Credits: 1.5 (prerequisites: TCOM 501 and 502, IT 341, or equivalent)
- TCOM 510 - Client-Server Architectures and Applications Credits: 1.5 (prerequisite: TCOM 505)
- TCOM 513 - Optical Communications Networks Credits: 1.5 (prerequisite: TCOM 503)
- TCOM 519 - Voice over IP Credits: 1.5 (prerequisites: TCOM 509, IT 341, or equivalent)
- TCOM 529 - Advanced Internet Protocols Credits: 1.5 (prerequisite: TCOM 509)
- TCOM 539 - Advanced Voice over IP Credits: 1.5 (prerequisite: TCOM 519)
- TCOM 551 - Digital Communication Systems Credits: 3 (prerequisite: TCOM 500 or equivalent)
- TCOM 607 - Satellite Communications Credits: 3 (prerequisite: TCOM 551, ECE 463, or equivalent)

Notes:

Students in the accelerated program who have passed IT 341 with a grade of B or higher will not be required to take TCOM 501 in the MS in TCOM core and may take an elective 1.5-credit course instead.

Degree Conferral

Students must apply to have the BS degree conferred the semester before they expect to complete the BS requirements. At the completion of the MS requirements, the MS degree will be awarded.

Master's Degree

Applied Information Technology, MS

Banner Code: VS-MS-AIT

School: Volgenau School of Engineering

Department: Applied Information Technology

We provide the very best graduate education in IT for high-potential leaders, especially those working on IT solutions that affect the federal government. Our objective is to graduate men and women of competence and character who can lead multidisciplinary teams in the design, justification, development, and management of mega-systems from data to decision in the private and federal sectors. Faculty include professors from the Volgenau School, the School of Management, and the College of Humanities and Social Sciences, plus industry leaders with unique reputations in the subject area as adjunct professors and guest lecturers. The faculty expose students to the pragmatic issues of IT, not just the theory.
Admission Requirements

Applicants must have completed a baccalaureate degree from an accredited program with a reputation for high academic standards and an earned GPA of 3.00 or better in their 60 highest-level credits. They must be experienced in the fundamentals of IT, quantitative methods, and finance. In addition, applicants must:

- Provide three letters of recommendation, preferably from academic references or references in industry or government who are familiar with the applicant’s professional accomplishments.
- Provide a detailed statement of career goals and professional aspirations.
- Earn a minimum TOEFL score of 575 for the paper-based exam or 230 for the computer-based exam (a minimum score of 600 for the paper-based exam or 250 for the computer-based exam is required for applicants who wish to be considered for a graduate teaching assistantship) if their native language is not English.

Degree Requirements

Core Courses (15 credits)

- AIT 597 - Developing IT Leaders of Integrity Credits: 3
- AIT 665 - Managing Information Technology Programs in the Federal Sector Credits: 3
- GSOM 540 - Analysis of Financial Decisions Credits: 3
- INFS 622 - Information Systems Analysis and Design Credits: 3
- SYST 505 - Introduction to Systems Engineering Credits: 3

Concentration Areas (12 credits):

Note: Students must select either four courses from one of the following concentrations or four courses from among the courses in any of the concentrations.

▲ Emerging Technologies (ETEC)

- ECE 507 - Seminar in Emerging Technologies Credits: 3
- SYST 659 - Topics in Systems Engineering Credits: 3
- AIT 690 - Advanced Topics in Applied Information Technology Credits: 3
- AIT 701 - Cyber Security: Emerging Threats and Countermeasures Credits: 3

▲ Cyber Security (CYBR)

- AIT 671 - Information System Infrastructure Lifecycle Management Credits: 3
- AIT 672 - Identity Management for Federal IT Credits: 3
• AIT 673 - Cyber Incident Handling and Response Credits: 3
• ISA 522 - Information Security Essentials Credits: 3
• ISA 650 - Security Policy Credits: 3

▲ Intelligence Technologies (NTLT)

• AIT 675 - Overview of the National Intelligence Community Credits: 3
• AIT 676 - The Intelligence Cycle Credits: 3
• AIT 677 - Intelligence Analysis Methods Credits: 3
• AIT 678 - Intelligence Problems and Challenges Credits: 3

Capstone Course (3 credits)

• AIT 685 - Capstone Seminar Credits: 3

Total: 30 credits

Master's Level Certificate

Applied Cyber Security Graduate Certificate

Banner Code: VS-CERG-ACBS

School: Volgenau School of Engineering

Department: Applied Information Technology

This certificate offers courses in four key elements of cyber security work. Designed for professionals who work for, or in support of, U.S. federal agencies, it provides post-bachelor's academic preparation for students who may not wish to complete a full master's degree program as well as for master's graduates who wish the topic-specific courses the certificate provides.

The graduate certificate may only be pursued on a part-time basis.

Admission Requirements

A bachelor's degree is required for admission to the program.

Certificate Requirements
Students must complete 12 credits chosen from the following list:

- ISA 522 - Information Security Essentials Credits: 3
- ISA 650 - Security Policy Credits: 3
- AIT 671 - Information System Infrastructure Lifecycle Management Credits: 3
- AIT 672 - Identity Management for Federal IT Credits: 3
- AIT 673 - Cyber Incident Handling and Response Credits: 3

Total: 12 credits

Intelligence Technologies Graduate Certificate

Banner Code: VS-CERG-NTLT

School: Volgenau School of Engineering

Department: Applied Information Technology

This graduate certificate offers courses in four key elements of intelligence analysis work. Designed for professionals who work for, or in support of, Intelligence Community agencies, it provides additional academic preparation for post-bachelor's students who may not wish to complete a full master's program as well as for master's graduates who wish the area-specific courses a certificate provides.

The graduate certificate may only be pursued on a part-time basis.

Admission Requirements

A bachelor's degree is required for admission to the program.

Certificate Requirements

Students must complete the following 12 credits:

- AIT 675 - Overview of the National Intelligence Community Credits: 3
- AIT 676 - The Intelligence Cycle Credits: 3
- AIT 677 - Intelligence Analysis Methods Credits: 3
- AIT 678 - Intelligence Problems and Challenges Credits: 3

Total: 12 credits
Bioengineering involves the application of tools and concepts in engineering and computation to problems in biology or medicine. The impact of engineering and computer science on biomedicine is wide ranging, from advanced biomedical imaging technologies to novel computational models of protein dynamics. With the growing costs of healthcare and the impact of novel technology to fundamental understanding in biosciences, the demand for bioengineers is growing. This program provides students with a solid foundation in engineering or computer science while offering in depth exposure to the life sciences. Bioengineering faculty members collaborate with colleagues at George Mason and nearby institutions including INOVA Health Center and federal laboratories such as the Naval Research Laboratory, the National Institutes of Health Clinical Center, and the National Institute of Standards and Technology. Research areas include: computational biology, bioinformatics, biosensors, magnetic resonance imaging, medical ultrasound, and neuroengineering.

The BS in Bioengineering is a challenging multidisciplinary training program whose goal is to enable graduates to be competitive for an entry-level position in the biomedical industry or to continue their education in graduate school or medical school. The curriculum provides a strong background in the biological and engineering fundamentals of bioengineering as well as upper level courses in areas of biomedical measurements, biomedical systems modeling, and bioinformatics. To accommodate the range of interests in bioengineering, the undergraduate degree offers two concentrations: 1) Biomedical Signals and Systems and 2) Biocomputation. In addition, students considering a career path as a health care professional in medicine, dentistry, veterinary medicine, can pursue Bioengineering as preparation for future studies.

With respect to graduate studies, students can conduct graduate-level bioengineering research and training under the mentorship of Bioengineering faculty while working toward an MS or PhD degree in Electrical and Computer Engineering or Computer Science.

Course Work

The Bioengineering Department offers 100 – 600 BENG courses; these can be found in the Courses chapter of this catalog.

Undergraduate Degree

Bioengineering, BS

Banner Code: VS-BS-BIOE

School: Volgenau School of Engineering
Bioengineering, also referred to as biomedical engineering, is the application of engineering tools and approaches to solve problems in biology and medicine. It is a broad and growing field that draws upon rapid advances in technology and computation, as well as on unprecedented growth in basic biological understanding.

This program concentrates on making measurements and analyzing complex data. It is challenging since it will provide a solid foundation in engineering or computer science, and also give in-depth exposure to the life sciences. The impact of engineering and computer science on biomedicine is wide, ranging from improved medical diagnosis through advanced imaging technologies, to enhanced biological understanding gained by computational models of protein function. With the growing demand for better health care while also containing its costs, the need for bioengineers is expected to be high.

The multidisciplinary training in this field will make graduates competitive for a position in government or the biomedical industry. It also enables students to continue their education in graduate school or medical school.

The educational objectives of the Bioengineering undergraduate program are the following:

- Alumni electing to work after graduation (for example, in industry or government) will contribute to the development or application of new products or processes that are of benefit to society.
- Alumni electing to continue their formal education will have completed their studies, or will have made demonstrable progress toward an advanced degree in their chosen profession.
- Alumni will communicate and perform effectively as members or leaders of multi-disciplinary teams.
- Alumni will continue to enhance their skills and knowledge in a quest for further professional development.

Degree Requirements

All bioengineering students are strongly advised to see their major advisor each semester before course registration. Undeclared students considering bioengineering are encouraged to obtain up-to-date information and advice from Bioengineering faculty.

Students must complete each BENG, BIOL, ECE and ENGR course presented as part of the required 120 credits for the degree with a grade of C or better.

There are two concentrations offered in the Bioengineering major: Biomedical Signals and Systems (BMSS) and Biocomputation (BIOC). The BMSS concentration emphasizes the systems and methods for acquisition and integration of biomedical signals. The BIOC concentration allows students to acquire knowledge and expertise in computer science applied to biomedical problems. Students must choose one of these two concentrations to complete the degree.

The 120 credits required for the BS in Bioengineering for both concentrations are listed below.

Bioengineering Credits: 26

- BENG 101 - Introduction to Bioengineering Credits: 3
- BENG 220 - Physical Bases of Biomedical Systems Credits: 3
- BENG 301 - Bioengineering Measurements Credits: 3
- BENG 302 - Bioengineering Measurements Lab Credits: 1
- BENG 304 - Modeling and Control of Physiological Systems Credits: 3
- BENG 320 - Bioengineering Signals and Systems Credits: 3
- BENG 380 - Introduction to Circuits and Electronics Credits: 3
- BENG 381 - Circuits and Electronics Lab Credits: 1
- BENG 491 - Bioengineering Senior Seminar I Credits: 1
• BENG 492 - Senior Advanced Design Project I Credits: 2
• BENG 493 - Senior Advanced Design Project II Credits: 2
• BENG 495 - Bioengineering Senior Seminar II Credits: 1

Biology Credits: 7

• BIOL 213 - Cell Structure and Function Credits: 4
• BENG 313 - Physiology for Engineers Credits: 3 OR BIOL 425 - Human Physiology Credits: 3

Computer Science Credits: 4

• CS 112 - Introduction to Computer Programming Credits: 4

Mathematics and Statistics Credits: 20

• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• MATH 203 - Linear Algebra Credits: 3
• MATH 213 - Analytic Geometry and Calculus III Credits: 3
• MATH 214 - Elementary Differential Equations Credits: 3
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Physics Credits: 8

• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1

Engineering Credits: 2

• ENGR 107 - Introduction to Engineering Credits: 2
Chemistry Credits: 4

- CHEM 251 - General Chemistry for Engineers Credits: 4

Communication and Economics Credits: 6

- COMM 100 - Public Speaking Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3

Concentration (25 credits)

▲Concentration in Biomedical Signals and Systems (BMSS)

This concentration requires successful completion of the following courses.

Bioengineering Credits: 3

- BENG 425 - Assistive Control of Biomedical Systems Credits: 3

Bioinformatics Credits: 3

Choose one of the following:
- BINF 401 - Bioinformatics and Computational Biology I Credits: 3
- CS 444 - Introduction to Computational Biology Credits: 3
- CS 445 - Computational Methods for Genomics Credits: 3

Physics Credits: 4

- PHYS 262 - University Physics III Credits: 3
- PHYS 263 - University Physics III Laboratory Credits: 1
Technical Foundation Credits: 6

This sequence of two technical courses allows students to elect foundation courses in computers and/or computational systems. Examples of approved sequences are:

- ECE 301 - Digital Electronics Credits: 3  AND  CS 222 - Computer Programming for Engineers Credits: 3
- CS 211 - Object-Oriented Programming Credits: 3  AND  CS 310 - Data Structures Credits: 3

Technical Electives Credits: 9

Choose 9 credits from the following:

- BENG 395 - Mentored Research in Bioengineering Credits: 3
- BENG 441 - Nanotechnology in Health Credits: 3
- BENG 525 - Neural Engineering Credits: 3
- BENG 538 - Medical Imaging Credits: 3
- BINF 354 - Foundations in Mathematical Biology Credits: 3
- CS 310 - Data Structures Credits: 3
- CS 444 - Introduction to Computational Biology Credits: 3
- CS 445 - Computational Methods for Genomics Credits: 3
- ECE 305 - Electromagnetic Theory Credits: 3
- ECE 421 - Classical Systems and Control Theory Credits: 3
- ECE 450 - Introduction to Robotics Credits: 3
- PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3
  and/or one only of the following:
- BIOL 305 - Biology of Microorganisms Credits: 3
- CHEM 313 - Organic Chemistry Credits: 3
- NEUR 327 - Cellular, Neurophysiological, and Pharmacological Neuroscience Credits: 3
- PSYC 372 - Physiological Psychology Credits: 3

▲ Concentration in Biocomputation (BIOC)

This concentration requires successful completion of the following courses.

Computer Science Credits: 16

- CS 105 - Computer Ethics and Society Credits: 1
- CS 211 - Object-Oriented Programming Credits: 3
- CS 310 - Data Structures Credits: 3
- CS 444 - Introduction to Computational Biology Credits: 3
- CS 445 - Computational Methods for Genomics Credits: 3
- CS 450 - Database Concepts Credits: 3
Mathematics Credits: 3

- MATH 125 - Discrete Mathematics I Credits: 3

Technical Electives Credits: 6

Students can choose 2 courses from the following approved technical electives.

- CS 480 - Introduction to Artificial Intelligence Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3
- CS 484 - Data Mining Credits: 3

OR Students can choose one of the courses listed above and one of these life science courses:

- BIOL 305 - Biology of Microorganisms Credits: 3 AND BIOL 306 - Biology of Microorganisms Laboratory Credits: 1
- NEUR 327 - Cellular, Neurophysiological, and Pharmacological Neuroscience Credits: 3
- PSYC 372 - Physiological Psychology Credits: 3

Additional University General Education (18 credits)

Students must complete all University General Education requirements not fulfilled by major requirements. BENG 492 and 493 are pending approval to meet the synthesis requirements. The General Education courses in Fine Arts, Global Understanding, and Literature must be selected from the courses approved by the department.

- Written Communication: 6 credits
- Literature: 3 credits
- Fine Arts: 3 credits
- Western Civilization/World History: 3 credits
- Global Understanding: 3 credits

Sample Schedules

Sample Schedule for Concentration in Biocomputation (BIOC)

First Semester Credits: 16

- CS 112 - Introduction to Computer Programming Credits: 4
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ENGH 101 - Composition Credits: 3
- ENGR 107 - Introduction to Engineering Credits: 2
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Second Semester Credits: 14

- BENG 101 - Introduction to Bioengineering Credits: 3
- CS 211 - Object-Oriented Programming Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1

Third Semester Credits: 17

- CHEM 251 - General Chemistry for Engineers Credits: 4
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- Global Understanding Elective Credits: 3

Fourth Semester Credits: 14

- BENG 220 - Physical Bases of Biomedical Systems Credits: 3
- BIOL 213 - Cell Structure and Function Credits: 4
- CS 105 - Computer Ethics and Society Credits: 1
- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3

Fifth Semester Credits: 16

- BENG 320 - Bioengineering Signals and Systems Credits: 3
- BENG 380 - Introduction to Circuits and Electronics Credits: 3
- BENG 381 - Circuits and Electronics Lab Credits: 1
- BIOL 425 - Human Physiology Credits: 3  OR  BENG 313 - Physiology for Engineers Credits: 3
- CS 310 - Data Structures Credits: 3
- Fine Arts Elective Credits: 3
Sixth Semester Credits: 16

- BENG 301 - Bioengineering Measurements Credits: 3
- BENG 302 - Bioengineering Measurements Lab Credits: 1
- BENG 304 - Modeling and Control of Physiological Systems Credits: 3
- CS 444 - Introduction to Computational Biology Credits: 3
- COMM 100 - Public Speaking Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Seventh Semester Credits: 15

- BENG 491 - Bioengineering Senior Seminar I Credits: 1 OR ECE 491 - Engineering Seminar Credits: 1
- BENG 492 - Senior Advanced Design Project I Credits: 2
- CS 445 - Computational Methods for Genomics Credits: 3
- CS 450 - Database Concepts Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
- Literature Elective Credits: 3

Eighth Semester Credits: 12

- BENG 493 - Senior Advanced Design Project II Credits: 2
- BENG 495 - Bioengineering Senior Seminar II Credits: 1
- HIST 100 - History of Western Civilization Credits: 3 OR HIST 125 - Introduction to World History
- Technical Elective Credits: 3
- Technical Elective Credits: 3

Sample Schedule for Concentration in Biomedical Signals and Systems (BMSS)

First Semester Credits: 16

- ENGR 107 - Introduction to Engineering Credits: 2
- CS 112 - Introduction to Computer Programming Credits: 4
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ENGH 101 - Composition Credits: 3
Second Semester Credits: 14

- BENG 101 - Introduction to Bioengineering Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- Literature Elective Credits: 3

Third Semester Credits: 17

- CHEM 251 - General Chemistry for Engineers Credits: 4 *
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- Global Understanding Elective Credits: 3

Fourth Semester Credits: 14

- BENG 220 - Physical Bases of Biomedical Systems Credits: 3
- BIOL 213 - Cell Structure and Function Credits: 4
- MATH 214 - Elementary Differential Equations Credits: 3
- PHYS 262 - University Physics III Credits: 3 *
- PHYS 263 - University Physics III Laboratory Credits: 1 *

Fifth Semester Credits: 16

- BENG 320 - Bioengineering Signals and Systems Credits: 3
- BENG 380 - Introduction to Circuits and Electronics Credits: 3
- BENG 381 - Circuits and Electronics Lab Credits: 1
- BIOL 425 - Human Physiology Credits: 3
- Approved Technical Foundations 1 Credits: 3
- Fine Arts Elective Credits: 3

Sixth Semester Credits: 16
- BENG 301 - Bioengineering Measurements Credits: 3
- BENG 302 - Bioengineering Measurements Lab Credits: 1
- BENG 304 - Modeling and Control of Physiological Systems Credits: 3
- COMM 100 - Public Speaking Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- Approved Technical Foundations II Credits: 3

Seventh Semester Credits: 15

- BENG 425 - Assistive Control of Biomedical Systems Credits: 3
- BENG 491 - Bioengineering Senior Seminar I Credits: 1 OR ECE 491 - Engineering Seminar Credits: 1
- BENG 492 - Senior Advanced Design Project I Credits: 2
- BINF 401 - Bioinformatics and Computational Biology I Credits: 3 OR CS 444 - Introduction to Computational Biology Credits: 3 OR CS 445 - Computational Methods for Genomics Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
- Technical Elective Credits: 3

Eighth Semester Credits: 12

- BENG 493 - Senior Advanced Design Project II Credits: 2
- BENG 495 - Bioengineering Senior Seminar II Credits: 1
- HIST 100 - History of Western Civilization Credits: 3 OR HIST 125 - Introduction to World History Credits: 3
- Technical Elective Credits: 3
- Technical Elective Credits: 3

Notes

* Students interested in medical school may substitute CHEM 211 - General Chemistry and CHEM 212 - General Chemistry for PHYS 262 - University Physics III, PHYS 263 - University Physics III Laboratory, and CHEM 251 - General Chemistry for Engineers. These students are encouraged to meet with the university's pre-health advisor to determine any additional courses that they should consider.

Advising

All Bioengineering students are assigned to a faculty member who serves as their academic advisor. Students are required to see their advisor prior to course registration each semester. GMU students interested in Bioengineering who have not declared a major, or are considering transferring, should contact the Bioengineering Program Office.

Termination from the Major
No math, science or Volgenau School of Engineering course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Civil, Environmental, and Infrastructure Engineering

Phone: 703-993-1675
Web: civil.gmu.edu

School: Volgenau School of Engineering

Faculty

Professors: Arciszewski, Bronzini (emeritus), Goodings (chair), Houck

Associate professors: deMonsabert, Venigalla

Assistant professors: Casey, Durant (associate chair), Kosoglu, Tanyu, Urgessa

Adjunct Faculty: Alliston-Brick, Bell, Benton, Binning, Chipley, Coronado, Donahue, Doyle, Faghri, Greene, Halkias, Hardy, Hartmann, Ibrahim, Kennedy, Kilpatrick, Krimmer, Laib, Loper, Loulakis, Matusik, McDonald, Miller, Moore, Nicholason, Oey, Reger, Rodriguez, Stein, Suehr, Swanson, Thoesen, Winters, Wolgast, Yang

The Civil, Environmental, and Infrastructure Engineering (CEIE) Department offers the BS, MS, MEng, and PhD degrees. These degree programs focus on the physical and organizational infrastructure essential to the functioning of an urban society. The bachelor’s program in civil and infrastructure engineering is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org

Civil and infrastructure engineering is the study of land, transportation, water resources, environmental, structural, geotechnical, and construction from a civil engineering perspective and within a complex technological, social, political, economic, and environmental context. The focus is on how these systems are successfully conceived, developed, designed, built, operated, maintained, and renewed in the built environment. This applies to major metropolitan areas in developed countries, such as Washington, D.C. and its integrated suburbs, and extends to infrastructure issues in developing nations which often involve very different issues.

An urban society thrives and prospers when adequate, appropriate, reliable, robust, secure, and cost-effective infrastructure systems are provided. The investment in existing infrastructure and other urban systems in the United States and abroad is enormous. The investment required to maintain, operate, renew, and manage the evolution of these infrastructure systems in the future is even greater. The need for highly educated and creative professionals to confront and solve these continuing vital problems is pressing. Examples of infrastructure systems include water supply and distribution; streets, roads, and highways; wastewater management; transit; storm water management; public utilities; energy supply and distribution; telecommunications; buildings, facilities, and structures; and solid waste management.

Course Work

The department offers all courses designated CEIE in the Courses chapter of this catalog.

Undergraduate Degree
Civil and Infrastructure Engineering, BS

Banner Code: VS-BS-CEIE

School: Volgenau School of Engineering

Department: Civil, Environmental and Infrastructure Engineering

The bachelor’s degree program provides essential underpinnings in the theory and design methods of civil and infrastructure engineering for engineering practice. Students benefit from exposure to practical civil, environmental, and infrastructure engineering problems and their solutions in the classroom, lab, and field. The educational objectives of the Civil and Infrastructure Engineering program describe expectations for graduates approximately three to five years after obtaining their BS CIE degree. Graduates of the program will be professionals who:

- Engage in the engineering practice of planning, designing, constructing, operating and maintaining sustainable infrastructure;
- Participate in public discussions concerning infrastructure in the urban, suburban, and exurban setting by providing professional guidance;
- Stay current through continuing education opportunities, professional conferences, graduate school, and other self-learning experiences; have the ability to obtain and maintain professional licensing.

Civil engineering students can look forward to a career in local, state, and federal government organizations, and in architectural and engineering firms that specialize in land development, transportation, water resources, environment, structures, geotechnical, construction, and other related fields. The program also prepares students for continuing graduate studies for sophisticated practice, research and teaching.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.

Degree Requirements

Degree requirements include 120 credits distributed in three main areas: mathematics and basic science, humanities and social sciences, and civil engineering analysis and design. Students must complete all math, science and Volgenau School of Engineering courses presented as part of the required 120 credits for the degree with a grade of C or better.

The prerequisite structure for these courses is extensive. The sample schedule below provides a listing of major and general education course requirements, as well as a guide to the progression of the courses to satisfy all prerequisites.

Students are required to see their faculty advisor at least once each year to plan their curriculum, and to develop an approved plan of study, which constitutes a learning plan for the degree program.

For the BS CIE degree, students must complete 120 credits, including all of the following:

Civil Engineering Credits: 43

- CEIE 117 - Information Technology for Engineering Credits: 3
- CEIE 203 - Geomatics and Engineering Graphics Credits: 3
- CEIE 210 - Statics and Dynamics Credits: 3
- CEIE 240 - Hydraulics Credits: 3
- CEIE 301 - Engineering and Economic Models in Civil Engineering Credits: 3
- CEIE 310 - Mechanics of Materials Credits: 3
- CEIE 311 - Structural Analysis Credits: 3
- CEIE 331 - Soil Mechanics Credits: 3
- CEIE 340 - Water Resource Engineering Credits: 3
- CEIE 355 - Environmental Engineering and Science Credits: 3
- CEIE 360 - Introduction to Transportation Engineering Credits: 3
- CEIE 370 - Construction Systems Credits: 3
- CEIE 400 - Civil Engineering Planning and Management Credits: 3
- CEIE 409 - Professional Practice and Management in Engineering Credits: 1
- CEIE 490 - Senior Design Project Credits: 3

Engineering Credits: 2

- ENGR 107 - Introduction to Engineering Credits: 2

Technical Electives Credits: 21

A total of 21 credit hours of CEIE Technical Elective courses must be selected. The first four CEIE technical core elective courses (12 credit hours) must be selected from four different specialty areas from among the six Civil Engineering specialty areas:

- construction engineering (CEIE 471 - Construction Administration or CEIE 472 - Building Information Modeling)
- environmental engineering (CEIE 450 - Environmental Engineering Systems or CEIE 453 - Water and Wastewater Treatment Processes)
- geotechnical engineering (CEIE 431 - Foundation Design or CEIE 435 - Introduction to Engineering Geology)
- structural engineering (CEIE 412 - Structural Steel Design or CEIE 413 - Reinforced Concrete Design)
- transportation engineering (CEIE 461 - Traffic Engineering or CEIE 462 - Urban Transportation Planning)
- water resources engineering (CEIE 440 - Water Supply and Distribution or CEIE 442 - Open Channel Flow).

The remaining 9 credit hours of the CEIE Technical Elective courses may be selected from any CEIE 4XX course. One 3 credit hour course of those remaining credit hours may be from related advanced science or engineering course offerings. Approval from the student's academic advisor is required before a non-CEIE course is taken to meet senior technical elective requirements for the degree.

Mathematics Credits: 14

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3

Physics Credits: 9
• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1
• PHYS 266 - Introduction to Thermodynamics Credits: 1

Chemistry Credits: 4

• CHEM 251 - General Chemistry for Engineers Credits: 4  OR  CHEM 211 - General Chemistry  Credits: 4

Biology Credits: 3

• BIOL 377 - Applied Ecology Credits: 3

Statistics Credits: 3

• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Communication and Economics Credits: 6

• COMM 100 - Public Speaking Credits: 3
• ECON 103 - Contemporary Microeconomic Principles Credits: 3

Additional University General Education Credits: 15

Students must complete all University General Education requirements not fulfilled by major requirements with one modification. CIE students are required to take 6 credits of written communication, 3 credits of literature, and courses in two of the following three areas: arts, global understanding, and western civilization/world history. This exemption means that CIE students meet the Volgenau School of Engineering's requirement for humanities and social science courses by taking 21 credits rather than 24. The two additional General Education areas to be satisfied must be approved by the CEIE faculty advisor with the goal of best meeting the general education needs of the student. All other University General Education requirements must be met as stated in the University General Education section of this catalog.

• Written Communication: 6 credits
• Literature: 3 credits
and courses selected from two of the following areas:

- Arts: 3 credits
- Western Civilization/world history: 3 credits
- Global Understanding: 3 credits

Writing-Intensive Requirement

The university's writing-intensive requirement for civil and infrastructure engineering majors is satisfied by the successful completion of CEIE 301 - Engineering and Economic Models in Civil Engineering.

Total: 120 credits

CEIE Honors Program

The department offers an Honors Program in Civil and Infrastructure Engineering that creates a community of outstanding scholars in civil engineering who share a commitment to learning, service, and leadership. The Program is crafted around the civil and infrastructure curriculum, and is distinct from the University Honors Curriculum. Entry to the Honors Program is by invitation, extended to students with a high school GPA of at least 3.80, and who enter the program as freshmen in fall 2010 or after. Inclusion of high-performing transfer students is expected in 2013.

The Honors program is challenging, designed for the highly motivated student, and consists of 120 credits. Honors students must satisfy requirements in addition to those of the normal BS CIE degree, including:

- An advanced communication course COMM 320 or COMM 637.
- A minimum of 18 credits of honors courses or honors sections. A maximum of 4 credits of the 18 total may be earned by taking MATH 116 or MATH 215
- All Honors students must take CEIE 490-H, the Honors section of the Senior Design Project for three credits.
- The remaining credits must be earned by taking a combination of: CEIE 5XX/6XX level courses and designated honors sections of other CEIE courses approved by a faculty advisor.

Once admitted to the Honors Program, students must remain in good standing and maintain a minimum cumulative GPA of 3.50 and a minimum GPA of 3.20 in each semester for all courses counting toward the BS CIE degree, maintain continuous enrollment working toward the BS CIE degree, and abide by the GMU Honor Code.

Sample Schedule

First Semester Credits: 16

- ENGR 107 - Introduction to Engineering Credits: 2
- CHEM 251 - General Chemistry for Engineers Credits: 4 OR CHEM 211 - General Chemistry Credits: 4
- ENGH 101 - Composition Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
Second Semester Credits: 14

- CEIE 117 - Information Technology for Engineering Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- General Education course Credits: 3

Third Semester Credits: 16

- CEIE 203 - Geomatics and Engineering Graphics Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- COMM 100 - Public Speaking Credits: 3
- General Education Literature Credits: 3

Fourth Semester Credits: 15

- CEIE 210 - Statics and Dynamics Credits: 3
- CEIE 240 - Hydraulics Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Fifth Semester Credits: 16

- CEIE 301 - Engineering and Economic Models in Civil Engineering Credits: 3
- CEIE 304 - Jr Engineering Competency Exam Credits: 0
- CEIE 310 - Mechanics of Materials Credits: 3
- CEIE 331 - Soil Mechanics Credits: 3
- CEIE 340 - Water Resource Engineering Credits: 3
- PHYS 266 - Introduction to Thermodynamics Credits: 1
- General Education course Credits: 3
Sixth Semester Credits: 15

- CEIE 311 - Structural Analysis Credits: 3
- CEIE 355 - Environmental Engineering and Science Credits: 3
- CEIE 360 - Introduction to Transportation Engineering Credits: 3
- CEIE 370 - Construction Systems Credits: 3
- BIOL 377 - Applied Ecology Credits: 3

Seventh Semester Credits: 16

- CEIE 400 - Civil Engineering Planning and Management Credits: 3
- CEIE 404 - Sr Engineering Competency Exam Credits: 0
- CEIE 409 - Professional Practice and Management in Engineering Credits: 1
- CEIE 4XX - CEIE Technical core elective Credits: 3
- CEIE 4XX - CEIE Technical core elective Credits: 3
- CEIE 4XX - CEIE Technical core elective Credits: 3
- CEIE 4XX - CEIE Technical elective Credits: 3

Eighth Semester Credits: 12

- CEIE 490 - Senior Design Project Credits: 3
- CEIE 4XX - CEIE Technical core elective Credits: 3
- CEIE 4XX - CEIE Technical elective Credits: 3
- CEIE 4XX - CEIE Technical elective Credits: 3

Termination from the Major

No math, science, or Volgenau School of Engineering course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Bachelor's/Accelerated Master's Program

Civil and Infrastructure Engineering, BS/Civil and Infrastructure Engineering, Accelerated MS
This option provides a way for Mason students to earn an MS in civil and infrastructure engineering in less time than if they graduated from the BS program and then applied to the MS program. This program can be completed in 144 credits.

Admission Requirements

Mason students in the BS in Civil and Infrastructure Engineering Program may apply for the BS/accelerated MS if they have earned 90 undergraduate credits with an overall GPA of at least 3.30 or their GPA in ENGR and CEIE courses is at least 3.30. Students who have not yet finished 90 credits may be accepted provisionally subject to satisfactory completion of 90 credits. All other criteria for admission are identical to criteria for admission into the MS program.

Degree Requirements

Students must complete 144 credits that satisfy requirements for both the BS and MS programs. Students register for 6 credits of CEIE 500-level courses in place of undergraduate technical elective courses. The CEIE 500-level courses selected for this purpose must be approved by the academic advisor. Students complete all MS requirements and may apply the two CEIE 500-level courses included in the BS program toward satisfaction of these requirements.

Conferral of Degrees

Students must apply to have the BS degree conferred the semester before they expect to complete the BS requirements. The master’s degree is granted on completion of MS requirements.

Master's Degree

Civil and Infrastructure Engineering, MS

Banner Code: VS-MS-CEIE

The Master of Science (M.S.) Degree is designed for students who have completed the B.S. in civil engineering, although students with related undergraduate degrees may be considered for provisional admission. The M.S. educates students in the theory and practice of civil engineering science and design, with a technical concentration. The Master’s degree is increasingly expected for high level practice in civil engineering, and prepares graduates to practice in civil engineering for: federal, state, or local government; engineering design firms; construction firms; public utilities; non-governmental organizations; and local and regional planning firms, among others. The M.S. serves as a foundation for subsequent study in a Ph.D. program in civil engineering, as well as for graduate studies in architecture, law, business, economics, finance, and public policy and administration.

The M.S. requires focused coursework and may include either an independent study project or a research thesis in six available concentrations (see below). Full-time students typically complete the degree in one and a half, to two years.
Admission Requirements

To be considered for admission to the program, a candidate must:

- Satisfy general University and Volgenau School requirements for admission to a graduate program,
- Have earned a baccalaureate degree in engineering or a related science,
- Provide three letters of reference, submitted by former professors or supervisors.
- Provide GRE score.

Acceptance to the degree program is based on an assessment of the applicant’s capacity to pursue graduate studies successfully. Consideration is given to the undergraduate record (especially upper division coursework), any previous graduate work, professional work experience, and reference letters. Well-qualified students with minor admission deficiencies may be provisionally admitted subject to completing an articulation program. Prescribed courses taken in the articulation program are not creditable toward the M.S. degree.

Degree Requirements

The program consists of two core courses; electives selected in one of six available concentrations, a thesis, project, and participation in the Departmental seminar series. An all-coursework option without a thesis or project is also available. Students must complete a faculty-approved plan of study with a minimum of 30 credits of graduate (500-level or greater) coursework.

Plan of Study

All M.S. students must develop a faculty advisor approved plan of study with a minimum of 30 credits of graduate work, including core courses, that develop a declared concentration; seminar requirement (CEIE795); and choice of project, thesis, or all-coursework option.

Students are responsible for developing and receiving advisor approval on a plan of study no later than the end of their first semester of study. Courses taken without prior approval by the faculty advisor may not be accepted for credit toward the degree. No more than three courses used for credit toward the M.S. may be cross-listed as undergraduate courses. None may repeat material completed as part of the student’s previous studies. Most M.S. courses are offered on a three-semester rotation.

Core Courses (6 credits)

Students must complete the following two core courses within the first 12 credit hours of their M.S. studies. These courses provide a common background for understanding the breadth and complexity of civil and infrastructure engineering and for analyzing and solving engineering problems.

- CEIE 601 - Infrastructure Modeling Credits: 3
- CEIE 605 - Infrastructure Systems Analysis Credits: 3

Concentrations (15-24 credits)

Students must select one concentration area and take a minimum number of courses in that area. The six concentration areas are:

- Construction Project Management
- Environmental Engineering
- Geotechnical Engineering
- Structural Engineering
Transportation Engineering
Water Resources Engineering

▲Concentration in Construction Project Management (CPM)

Choose at least two of the following courses:

- CEIE 573 - Legal Aspects of the Construction Process Credits: 3
- CEIE 575 - Design for Constructability Credits: 3
- CEIE 576 - Construction Cost Estimating Credits: 3

Choose at least three of the following courses; the third course listed above may be counted as one of these three.

- CEIE 525 - Structural Evaluation and Rehabilitation Credits: 3
- CEIE 531 - Earth Retaining Structures and Slope Stability Credits: 3
- CEIE 535 - Engineering Geology Credits: 3
- CEIE 556 - Environmental Law Credits: 3
- CEIE 571 - Construction Administration Credits: 3 *
- CEIE 572 - Building Information Modeling Credits: 3 *
- CEIE 580 - Risk and Reliability in Civil Engineering Practice Credits: 3
- CEIE 633 - Advanced Foundation Design and Ground Improvement Credits: 3
- CEIE 636 - Sources of Geotechnical Data Credits: 3
- CEIE 777 - Analytical Methods for Construction Operations Credits: 3

*Cross-listed as undergraduate courses

▲Concentration in Environmental Engineering (EENG)

Choose at least two of the following courses:

- CEIE 641 - Water Resources Engineering I: Principles and Practice Credits: 3
- CEIE 644 - Groundwater Systems Modeling Credits: 3
- CEIE 657 - Environmental Engineering Microbiology Credits: 3

Choose at least three of the following courses; the third course listed above may be counted as one of these three.

- CEIE 501 - Sustainable Development Credits: 3
- CEIE 510 - Geographic Information Systems in Engineering Credits: 3 *
- CEIE 540 - Water Supply and Distribution Credits: 3 *
- CEIE 550 - Environmental Engineering Systems Credits: 3 *
- CEIE 552 - Wastewater Engineering Credits: 3 *
- CEIE 556 - Environmental Law Credits: 3
- CEIE 683 - Water and Wastewater Systems Security Credits: 3

*Cross-listed as undergraduate courses

▲Concentration in Geotechnical Engineering (GEOE)

Choose at least two of the following courses:

- CEIE 531 - Earth Retaining Structures and Slope Stability Credits: 3
- CEIE 633 - Advanced Foundation Design and Ground Improvement Credits: 3
- CEIE 636 - Sources of Geotechnical Data Credits: 3
Choose at least three of the following courses; the third course listed above may be counted as one of these three.

- CEIE 524 - Introduction to Bridge Engineering Credits: 3
- CEIE 525 - Structural Evaluation and Rehabilitation Credits: 3
- CEIE 535 - Engineering Geology Credits: 3 *
- CEIE 573 - Legal Aspects of the Construction Process Credits: 3
- CEIE 575 - Design for Constructability Credits: 3
- CEIE 580 - Risk and Reliability in Civil Engineering Practice Credits: 3
- CEIE 621 - Applied Finite Element Methods Credits: 3
- CEIE 634 - Groundwater and Geoenvironmental Design Credits: 3
  *Cross-listed as undergraduate courses

▲ Concentration in Structural Engineering (STRE)

Choose at least two of the following courses:

- CEIE 524 - Introduction to Bridge Engineering Credits: 3
- CEIE 525 - Structural Evaluation and Rehabilitation Credits: 3
- CEIE 526 - Advanced Steel Design Credits: 3
  Choose at least three of the following courses; the third course listed above may be counted as one of these three.
- CEIE 512 - Structural Steel Design Credits: 3 *
- CEIE 513 - Reinforced Concrete Design Credits: 3 *
- CEIE 527 - Pre-stressed Concrete Credits: 3
- CEIE 575 - Design for Constructability Credits: 3
- CEIE 621 - Applied Finite Element Methods Credits: 3
- CEIE 633 - Advanced Foundation Design and Ground Improvement Credits: 3
- CEIE 894 - Design and Inventive Engineering Credits: 3
  *Cross-listed as undergraduate courses

▲ Concentration in Transportation Engineering (TRNE)

Choose at least two of the following courses:

- CEIE 663 - Intelligent Transportation Systems Credits: 3
- CEIE 762 - Transportation System Planning Models Credits: 3
- CEIE 767 - Traffic Engineering Modeling and Analysis Credits: 3
  Choose at least three of the following courses; the third course listed above may be counted as one of these three.
- CEIE 501 - Sustainable Development Credits: 3
- CEIE 510 - Geographic Information Systems in Engineering Credits: 3 *
- CEIE 560 - Public Transportation Systems Credits: 3
- CEIE 561 - Traffic Engineering Credits: 3 *
- CEIE 562 - Urban Transportation Planning Credits: 3 *
- CEIE 580 - Risk and Reliability in Civil Engineering Practice Credits: 3
- CEIE 690 - Topics in Civil Engineering Credits: 3
  *Cross-listed as undergraduate courses

▲ Concentration in Water Resources Engineering (WRE)
Choose at least two of the following courses:

- CEIE 641 - Water Resources Engineering I: Principles and Practice Credits: 3
- CEIE 742 - Water Resources Engineering II: Water Resource Systems Credits: 3
- CEIE 644 - Groundwater Systems Modeling Credits: 3

Choose at least three of the following courses; the third course listed above may be counted as one of these three.

- CEIE 501 - Sustainable Development Credits: 3
- CEIE 510 - Geographic Information Systems in Engineering Credits: 3 *
- CEIE 540 - Water Supply and Distribution Credits: 3 *
- CEIE 542 - Open Channel Flow Credits: 3 *
- CEIE 550 - Environmental Engineering Systems Credits: 3
- CEIE 556 - Environmental Law Credits: 3
- CEIE 683 - Water and Wastewater Systems Security Credits: 3

*Cross-listed as undergraduate courses

Note:

Electives from outside the chosen concentration are permitted with advisor approval.

**Project, Thesis, or All-coursework Option**

As part of the plan of study developed within the first semester of M.S. study, students must elect to pursue the project option, the thesis option or the all-coursework option.

**Project (3 credits)**

Students complete CEIE 798, during which they prepare and present a scholarly paper. The scholarly paper is a technical report on an independent study, laboratory or computer experimentation, or literature search on a current civil and infrastructure engineering topic selected under the guidance of a faculty advisor. Students must demonstrate knowledge of the topic and make a satisfactory technical presentation of the paper in the CEIE graduate seminar (CEIE 795). CEIE798 credits count toward the 30 credit hours required for the M.S. degree.

- CEIE 798 - Research Project in Civil Engineering Credits: 3

**Thesis (6 credits)**

Students complete CEIE 799, which counts toward the 30 credit hours required for the M.S. degree. The master’s thesis should reflect a significant, independent research effort that advances engineering science, and is worthy of publication. The work is conducted under the guidance of a faculty thesis advisor, and the final written thesis and oral defense are defended before a three-member faculty committee. In addition, students must make a satisfactory presentation of the thesis in the CEIE graduate seminar. The thesis is recommended for those students who wish to develop and document their research skills, or contemplate subsequent enrollment in a PhD program. Students are advised of the university’s continuous registration requirement for thesis and dissertation research credits. Upon first enrolling in CEIE 799, the student must continue registration for each fall and spring semester until the thesis is successfully completed.

- CEIE 799 - Master's Thesis Credits: 1-6 (must complete 6 credits)
All-coursework

Students complete extra credits in their concentration area to meet the 30 credit hours required for the M.S. degree. This option is suited for students not interested in research or independent study or for professionals interested in coursework only. No technical presentation is required for students who select this option.

Seminar Requirement

All degree candidates must attend a minimum of ten graduate seminars approved by the CEIE Department for the degree program. Further, they are required to present the results of their project or thesis research as part of the Department seminar series. Students must enroll in CEIE 795 each semester (fall and spring) for the duration of their M.S. studies. This course is used to verify the seminar attendance requirement and is repeatable.

- CEIE 795 - Civil and Infrastructure Engineering Seminar Credits: 0

Total: 30 credits

Geotechnical, Construction, and Structural Engineering, MEng

Banner Code: VS-MENG-GCS

School: Volgenau School of Engineering

Department: Civil, Environmental, and Infrastructure Engineering

The Master of Engineering (MEng) in Geotechnical, Construction, and Structural Engineering (GeoConStruct) program was designed in collaboration with leading engineers in practice to develop a course of study that recognizes that geotechnical engineering, construction engineering, and structural engineering are practiced together and should be taught together in an integrated manner. Its purpose is to educate engineers for practice, for excellence in design and execution now, laying the groundwork for practice demands 25 years from now. It is a program that balances theory and practice, building on the foundation of an undergraduate degree in civil engineering.

The MEng is practice-focused and entirely course-based. Students who wish to undertake a degree requiring a project or a research thesis should consider the Master of Science in Civil and Infrastructure Engineering with emphasis in geotechnical or construction or structural engineering, or a program of study that creates a coherent integrated program of study between these three. All courses offered for the MEng program are open to MS students.

Admission Requirements

To be considered for admission to the MEng program, a candidate must:

- Satisfy general University and Volgenau School requirements for admission to a graduate program,
- Have earned a baccalaureate degree in engineering or a related science,
- Provide three letters of recommendation from individuals knowledgeable about the applicant’s academic or professional work,
- Provide a professional résumé.

Acceptance to the degree program is based on an assessment of the applicant’s capacity to pursue graduate study successfully. Students are assumed to have completed an undergraduate degree in civil engineering. Consideration is given to the undergraduate record (especially upper division coursework), standardized test scores (e.g., General GRE) if provided, any previous graduate work, professional work experience, and reference letters. Well-qualified students with minor admission deficiencies or with undergraduate degrees in related fields, such as geology or another branch of engineering, may be provisionally admitted subject to completing an articulation program of civil engineering undergraduate courses. Courses required for articulation are not creditable toward the MEng degree.

Research Assistantships and Fellowships are typically not awarded to students pursuing the MEng Program because it is entirely a course-based degree, rather than a research degree. Students interested in Teaching Assistantships (usually reserved for full-time graduate study) should indicate their interest on their application and also contact the Department after an admissions decision is made.

Degree Requirements

The program requires the completion of ten 3-credit graduate courses. Those ten courses include five core courses required of all students in the program, four concentration courses, and one elective course. There is no project or thesis requirement for the MEng degree. Most MEng courses are offered once every three semesters and are scheduled to meet in the late weekday afternoon or evening. Full-time students typically complete the program in three semesters.

Required Courses: 15 Credits

- CEIE 524 - Introduction to Bridge Engineering Credits: 3
- CEIE 525 - Structural Evaluation and Rehabilitation Credits: 3
- CEIE 531 - Earth Retaining Structures and Slope Stability Credits: 3
- CEIE 575 - Design for Constructability Credits: 3
- CEIE 580 - Risk and Reliability in Civil Engineering Practice Credits: 3

Concentration Courses: 12 Credits

For the four concentration courses, at least three must be selected in one of the areas listed below. The fourth course may also be selected from within the same concentration area (excepting those students choosing the GEOE concentration), another concentration area, or, with approval from the program advisor, may be from another CEIE graduate course numbered 500 or greater or another GMU graduate course numbered 600 or greater.

A course marked with * below indicates a course is cross-listed with an undergraduate course. No more than three cross-listed courses may be used for credit toward the MEng. None may repeat material completed as part of the student’s previous studies.

The available program concentration areas are:

▲ Geotechnical Engineering (GEOE)

- CEIE 535 - Engineering Geology Credits: 3
• CEIE 633 - Advanced Foundation Design and Ground Improvement Credits: 3
• CEIE 634 - Groundwater and Geoenvironmental Design Credits: 3

▲Structural Engineering (STRE)

• CEIE 512 - Structural Steel Design Credits: 3 *
• CEIE 513 - Reinforced Concrete Design Credits: 3 *
• CEIE 526 - Advanced Steel Design Credits: 3
• CEIE 527 - Pre-stressed Concrete Credits: 3
• CEIE 621 - Applied Finite Element Methods Credits: 3

▲Construction Engineering (CENG)

• CEIE 571 - Construction Administration Credits: 3 *
• CEIE 572 - Building Information Modeling Credits: 3 *
• CEIE 573 - Legal Aspects of the Construction Process Credits: 3
• CEIE 576 - Construction Cost Estimating Credits: 3
• CEIE 777 - Analytical Methods for Construction Operations Credits: 3

Elective Course: 3 Credits

In consultation with the student’s faculty advisor, one elective should be chosen as part of the GeoConStruct Degree. The elective should complement the plan of study. Suggested courses are listed below:

Overarching Electives

• CEIE 894 - Design and Inventive Engineering Credits: 3
• PUBP 729 - Transportation Asset Management Credits: 3
• PUBP 752 - Infrastructure Finance Credits: 3

Total: 30 Credits

Master’s Level Certificate

Civil Infrastructure and Security Engineering Graduate Certificate
This program is appropriate for civil infrastructure (such as transportation, water and waste water, and utilities) owners and operators, designers, planners, maintenance staff, and other technical workers in the public and private sectors who are responsible for improving facility and equipment performance, reliability, security, efficiency, and management practices.

New approaches to civil infrastructure problems are emerging that use traditional civil engineering domain knowledge in the context of IT with a systems approach to analyze the complexity of and interaction among various infrastructure components and their performance. Currently, the most important challenge to infrastructure engineering is to improve the quality of stewardship, which falls far short of public expectations, and improve immediately the security of critical civil infrastructure. The certificate is intended to respond uniquely to the need for broad training in the holistic and systems approach to the long term management of infrastructure, with specific attention to risk and vulnerability assessments, and creative solutions to providing improved system security. The certificate program is flexible and can be tailored to the needs of students within the infrastructure engineering community, but it is also intended to be responsive to the needs of infrastructure owners, operators, and other technical staff.

The graduate certificate may be pursued on a part-time or full-time basis.

Admission Requirements

Candidates should have a bachelor’s degree in engineering, architecture, mathematics, science, or other related technical field, and must be computer literate. Candidates should inquire with the certificate coordinator for details of program planning. Courses are offered in late afternoon and evening and are particularly suitable for part-time students.

Certificate Requirements

The certificate program consists of 15 credits (five courses) selected from certificate program courses and elective courses. The certificate courses are aimed at building the foundations of asset management methods based on a holistic and systems approach. The certificate program courses consist of the following:

One core course

- CEIE 680 - Introduction to Infrastructure and Security Engineering Credits: 3

Minimum of two of the following specific sector courses:

- CEIE 681 - Security of Structural Systems Credits: 3
- CEIE 683 - Water and Wastewater Systems Security Credits: 3
- CEIE 686 - Transportation System Security and Safety Credits: 3

Remaining elective credits selected from the following:

- CEIE 510 - Geographic Information Systems in Engineering Credits: 3
- CEIE 511 - Introduction to Design and Inventive Engineering Credits: 3
- CEIE 671 - Best Engineering Management Practices Credits: 3
• CEIE 690 - Topics in Civil Engineering Credits: 3
• PUAD 661 - Public Budgeting Systems Credits: 3
• PUBP 729 - Transportation Asset Management Credits: 3
• PUBP 752 - Infrastructure Finance Credits: 3

Note:

Selection of courses is subject to approval of the certificate coordinator to ensure cohesiveness and compatibility. Some courses may have prerequisites for which the student must qualify or seek a waiver from the appropriate instructor. A cumulative GPA of 3.00 is required, and no more than one course with a grade of C may be applied toward the certificate.

Total: 15 credits

Leading Technical Enterprises Graduate Certificate

Banner Code: VS-CERG-LTE

School: Volgenau School of Engineering

Department: Civil, Environmental and Infrastructure Engineering

This graduate certificate is a professional program tailored to meet the needs of engineering companies and technical organizations. It targets engineering and other technical employees who wish to align themselves with the learning organization doctrine of developing leaders and other employees interested in increasing their understanding of new business opportunities may be identified, successfully marketed, planned and managed. Since 2003, a comparable program has been offered under contract through the Office of Continuing Professional Education (OCPE) to the Headquarters, US Army Corps of Engineers and The Dewberry Companies.

Technological change and the increase in privatization and enterprise development trends within the private sector require a wide variety of multidisciplinary skills for the successful management of technical programs and projects. This certificate is intended to respond to the need for broad training in technical leadership, entrepreneurial development, performance measurement, engineering information management, and infrastructure financial planning. The certificate program is flexible and can be adapted to the needs of engineering professionals who provide technical services to both the public and private sectors.

The graduate certificate may be pursued on a part-time or full-time basis.

Admission Requirements

Potential candidates should have a bachelor's degree in Engineering, Architecture, Mathematics, Science, Business, or other related field. Courses are offered weekly on campus or at previously arranged off-site facilities and are intended for part-time students. Some of the courses may be offered in a distance learning format.

Certificate Requirements

This 15 credit certificate program consists of two core courses (6 credits), and 9 elective credits (three courses) selected from the certificate program course listing or other approved MS Degree course offerings. These courses are aimed at building the
foundations of engineering enterprise development and engineering leadership. The elective certificate program courses consist of the following:

**One core course:**

- CEIE 675 - Developing the Technical Enterprise Credits: 3

and **12 elective credits (four courses)**

Select from the list below:

- CEIE 671 - Best Engineering Management Practices Credits: 3
- CEIE 673 - Leading Engineering Innovation Credits: 3
- CEIE 674 - Infrastructure Finance Credits: 3
- CEIE 685 - Civil Engineering Information Management Credits: 3
- other approved MS degree course offerings

**Note:**

These courses are accepted for credit towards the George Mason University MS in Civil and Infrastructure Engineering. A cumulative GPA of 3.00 is required, and no more than one course with a grade of C may be applied toward the certificate.

**Total: 15 credits**

**Sustainability and the Environment Graduate Certificate**

**Banner Code: VS-CERG-SENV**

**School: Volgenau School of Engineering**

**Department: Civil, Environmental and Infrastructure Engineering**

The principal focus of this certificate is to provide a detailed understanding of evolving sustainability concepts, particularly as relating to land development and the impact of evolving development on the environment. The five course series will give the student a detailed understanding of land analysis and valuation, engineering concepts related to land development, the impact of the environment on development, and the key concepts of sustainable development.

The graduate certificate may be pursued on a part-time or full-time basis.

This has been designated a Green Leaf program. For further information, please go to Green Leaf Programs and Courses.
Admissions Requirements

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or higher, preferably in civil engineering or a closely related field. In addition, this graduate certificate requires students to have a basic understanding of real estate development, significant experience in the real estate industry, and/or completion of REAL 500 Real Estate Development Fundamentals.

Certificate Requirements

Students must complete the following five courses, with a grade of B or better.

- REAL 502 - Real Estate Client Leadership and Project Management Credits: 3
- CEIE 500 - Land Development Engineering Credits: 3
- CEIE 501 - Sustainable Development Credits: 3
- CEIE 555 - Introduction to Environmental Engineering Credits: 3
- CEIE 673 - Leading Engineering Innovation Credits: 3

Total: 15 Credits

Water Resources Engineering Graduate Certificate

Banner Code: VS-CERG-WRE

School: Volgenau School of Engineering

Department: Civil, Environmental and Infrastructure Engineering

Water resources engineering is the application of the sciences of hydrology and hydraulics to serve society. This includes planning, designing and managing systems to provide: reliably dry places for society’s activities; dependable, high quality water supplies for industrial, municipal, residential, and other uses; sustainable water-related ecologies; and other uses of our water resources. This program is designed for engineers and others interested in pursuing advanced study of water resources.

The graduate certificate may be pursued on a part-time or full-time basis.

Admission Requirements

Candidates should have a bachelor’s degree in engineering, architecture, mathematics, science, or other related technical field, and must be proficient with modern computer Internet tools. Candidates should inquire with the certificate coordinator for details of program planning. Courses are offered in late afternoon and evening and are particularly suitable for part-time students.

Certificate Requirements
The certificate program consists of 15 credits (five courses) including two required courses (6 credits), and three elective courses (9 credits). Specific requirements are:

**Required Courses**

- CEIE 641 - Water Resources Engineering I: Principles and Practice Credits: 3
- CEIE 742 - Water Resources Engineering II: Water Resource Systems Credits: 3

**Elective Courses**

These courses are divided into three categories; a student must take a minimum of one course from the methods group, and a minimum of two courses from either the policy group or the practice group. A minimum of three elective courses (9 credits) are required for the certificate.

**Methods**

- CEIE 510 - Geographic Information Systems in Engineering Credits: 3
- CEIE 605 - Infrastructure Systems Analysis Credits: 3
- CEIE 690 - Topics in Civil Engineering Credits: 3

**Policy**

- CEIE 501 - Sustainable Development Credits: 3
- CEIE 550 - Environmental Engineering Systems Credits: 3
- CEIE 556 - Environmental Law Credits: 3
- CEIE 683 - Water and Wastewater Systems Security Credits: 3

**Practice**

- CEIE 500 - Land Development Engineering Credits: 3
- CEIE 540 - Water Supply and Distribution Credits: 3
- CEIE 542 - Open Channel Flow Credits: 3
- CEIE 644 - Groundwater Systems Modeling Credits: 3

**Total: 15 Credits**

**Doctoral Degree**
Civil and Infrastructure Engineering, PhD

Banner Code: VS-PHD-CEIE

School: Volgenau School of Engineering

Department: Civil, Environmental and Infrastructure Engineering

The Doctor of Philosophy in Civil and Infrastructure Engineering (CIE) was created to prepare students for advanced leadership positions in research and development in the public or private sector, academics, or government. Students may elect to study in the areas of: environmental engineering, geotechnical engineering, water resources engineering, construction engineering and management, infrastructure systems engineering, structural engineering, or transportation engineering. Admitted students will complete both required and applicable course work in their technical interest area based on a plan of study prepared with a doctoral advisor. They will take qualifying exams that assess student’s breadth of knowledge at the graduate level and competency to conduct research. They will gain experience through required teaching at the undergraduate level. They will form a doctoral committee, prepare, then defend a dissertation proposal leading to PhD candidacy. Finally, they will conduct original scholarly research and prepare, then defend a doctoral dissertation. Both part-time and full-time study is available.

Admission Requirements

All general George Mason University and specific Volgenau School admission requirements (including deadlines) apply. In addition, all applicants, including Mason undergraduates, must submit the following:

- Official transcript of undergraduate and graduate course work,
- For applicants whose official language is not English, official TOEFL scores which meet the minimum requirements set by the Volgenau School,
- Three letters of recommendation from individuals knowledgeable about the applicant’s professional or academic work (at least two of the letters should be from individuals with doctorates),
- Recent professional résumé,
- Substantial statement of interest that includes a description of the specific area of proposed dissertation research, contacts the student has made with potential faculty advisors, and an explanation of career and research goals,
- Official results of the GRE general test.

Admission decisions will be based on the student’s qualifications and the availability of a faculty advisor in their proposed area of research. The application materials will be reviewed by the department doctoral committee and decisions made with input from appropriate faculty members.

Financial support for outstanding applicants is available in the form of fellowships as well as research and teaching assistantships. For best consideration, applicants are encouraged to apply early and to contact potential faculty advisors to express interest in support.

Reduction of Credit

Students must complete a minimum of 72 graduate credits, which may be reduced by a maximum of 24 credits from a completed master’s degree. Reduction of credit requires the approval of the program director or designee and the dean or designee of the school. They determine whether the credits are eligible for reduction of credit and applicable to the degree program and the number of credits to be reduced.

Degree Requirements
The PhD in Civil and Infrastructure Engineering requires 72 graduate credits, including 48 credits of graduate coursework and 24 credits of research. Admitted students are expected to hold a Bachelor of Science in Civil Engineering or degree in a closely-related science field.

Exceptionally-qualified students without a related Bachelor’s or Master’s degree may be admitted provisionally and required to take additional undergraduate- and graduate-level articulation courses prescribed by the doctoral committee, which will not count towards the PhD degree.

The following degree plan is based on a student who receives a full 24 credit reduction. Students who do not receive a full credit reduction should choose additional credits in consultation with their advisor.

**Doctoral Coursework (24 credits)**

A minimum GPA of 3.50 is required and no C grades are allowed for the 24 credits earned beyond the MS. A detailed plan of study will be prepared for each student upon acceptance into the program and in consultation with the faculty advisor, which outlines all course requirements to include:

**Required Courses (6 credits)**

The following must be completed while in residence in the program.

- CEIE 800 - Civil, Environmental, and Infrastructure Engineering Colloquium Credits: 1 (must be taken at least twice)
- CEIE 894 - Design and Inventive Engineering Credits: 3
- CEIE 990 - Civil and Infrastructure Dissertation Topic Presentation Credits: 1

**Courses chosen with Advisor (18 credits)**

Remaining courses, especially in the student’s technical interest area, will be chosen in consultation with his or her advisor in accordance with the following requirements:

- A minimum of 9 credits at the 700-level or higher
- A maximum of 6 credits of directed reading courses at any level (e.g., CEIE 796, CEIE 896)
- A minimum of 3 credits of statistics at the 500-level or above outside the CEIE Department.
- No cross-listed courses may apply to the degree.

**Qualifying Exam**

Based on demand, qualifying exams will be offered twice a year prior to the start of the fall and spring semesters. The qualifying exam is intended to test the student’s breadth of knowledge in their research area. Students entering with a MS degree are required to take the qualifying exams upon completing 18 credits in the program. Students entering without a MS degree must take the qualifying exam upon completion of 30 credits. Exceptional students may be allowed to take the exams earlier based on doctoral advisor recommendation and approval of the CEIE Graduate Coordinator.

The qualifying exam consists of two written exams and one oral exam. One written exam will be in the student’s primary research area. The other written exam will be in a student-selected secondary area. The level of knowledge for the primary exam is MS-level, while the level for the secondary exam is BS-level. The available examination areas include:

- Area A: Water and Resources Engineering
- Area B: Construction Engineering and Management
- Area C: Geotechnical Engineering
Area D: Transportation Engineering  
Area E: Infrastructure Systems Engineering  
Area F: Structural Engineering  
Area G: Environmental Engineering

At least 30 days before the scheduled exam date, students are required to request exams in their primary and secondary areas from the above list. A written exam for each area will be administered to the candidate, typically on the same day. The specific requirements for each exam (reading list, allowed references, etc.) will be announced prior to the exam date. On a second date, students are required to attend an oral interview with an examining committee of at least four members of the CEIE faculty. The interview will consist of discussion of the student’s written exam results as well as questions to determine preparedness to conduct independent research. Students will receive separate pass/fail grades for the primary and secondary written exams and an overall pass/fail grade for the qualifying exam.

Students who receive an overall pass grade are allowed to form a dissertation committee and to register for CEIE 998 Dissertation Proposal Preparation. Unsuccessful students who receive an overall fail grade are allowed to repeat the exam once. If the student receives a fail grade on one focus area exam, he or she must repeat that exam on the second attempt. If the student receives a fail grade on both focus area exams, he or she must repeat both exams on the second attempt. The second attempt at passing the qualifying exams must be within one calendar year or the next scheduled examination date, whichever is greater. Students who do not receive an overall pass grade on the second attempt are excused from the program.

Dissertation Research (24 credits)

Students become eligible for CEIE 998 upon passing the qualifying exam (preceding section). Upon admission to candidacy, which requires satisfactory preparation and defense of a dissertation proposal, students may register for CEIE 999.

- CEIE 998 - Doctoral Dissertation Proposal Credits: 1-12 (must complete a minimum of 12 credits)
- CEIE 999 - Doctoral Dissertation Credits: 1-12 (must complete a minimum of 12 credits)

Dissertation Committee

A dissertation committee (separate from the examination committee) is formed upon successful completion of the qualifying exams. The student, in consultation with their advisor, shall select two or more full-time CEIE Department faculty members, and at least one committee member from outside the department. At least three members of the committee are to be members of the Mason graduate faculty. All committee members must hold earned doctorates and possess applicable knowledge and experience in the student’s chosen topic. The CEIE Faculty must approve the composition of the dissertation committee, specifically for outside committee members. The committee must be formed and approved before admission to candidacy (described in the next section) and before registering for CEIE 999 Dissertation Preparation. Substitutions to the dissertation committee are allowed with the approval of the CEIE Department chair.

Dissertation Proposal Preparation and Advancement to Candidacy

After successfully passing the qualifying exams and forming of a dissertation committee, the student may register for CEIE 998 research credits and begin preparation of the dissertation research proposal. At least 12 credits of CEIE 998 are required during which the student will consult with his or her advisor on the selection of an original scholarly topic and preparation of a formal research proposal. Students are also encouraged to register for the required CEIE 990 Civil and Infrastructure Dissertation Topic Presentation course during this time. Students must schedule a formal proposal defense (also known as the research competency exam) with all members of their chosen committee present. This may not be done before successful completion of the qualifying exams. Committee members should receive printed copies for the final proposal not less than two weeks prior to the scheduled defense date.

The research competency exam (proposal defense) includes the written proposal and a presentation of the planned dissertation research. The dissertation proposal defense shall not include already completed research. The dissertation proposal defense is the
main opportunity for the committee to provide input and for the dissertation committee members to examine the student’s knowledge in higher-level course work and familiarity with existing and emerging research related to the student’s research area. After the student’s presentation, and after private deliberation, the committee makes a pass/fail determination that is given to the student by his or her advisor.

Students who pass the research competency exam are admitted to candidacy and become PhD Candidates. Students who do not pass the exam may, in consultation with their advisor, schedule a second exam within 120 days of receiving notice of the first exam result. Students who do not re-schedule and successfully pass the research competency within this period are dismissed from the program.

Dissertation Research and Defense

On successful completion of the dissertation proposal, students are to conduct original research under the guidance of their dissertation director and dissertation committee members. Students are not to schedule their dissertation defense sooner than two semesters after a successful proposal defense. During the dissertation research period, students must present their research at least once in the form of a department seminar. The dissertation must represent achievement in research, must be a significant contribution to the field of civil engineering, and should be deemed publishable in refereed journals. When the majority of the research has been completed, the candidate is to submit a written draft of the dissertation to the doctoral dissertation committee and schedule an oral pre-defense with the doctoral dissertation committee. The pre-defense is to be attended by the doctoral dissertation committee and the department chair.

A final, public, oral defense may be scheduled no sooner than one month after the conclusion of the pre-defense, which will allow for a minimum of two weeks to advertise it broadly. The final defense is to be attended by the doctoral dissertation committee and the department chair. On successful completion of the oral defense, students must submit a final publishable dissertation that meets the guidelines specified by the Guide for Preparing Graduate Theses, Dissertations, and Projects. If the student fails to defend the dissertation successfully, the student may request a second defense following the same procedures as the initial defense. This request has no time limit, other than the general time limits for the doctoral degree as per Mason policy. An additional pre-defense is not required; however, the student is strongly advised to consult with the committee before scheduling the second defense. If the student fails on the second attempt to defend the dissertation, the student will be dismissed from the PhD program. Following a successful public defense and completion of the final form of the dissertation, the dissertation committee recommends the candidate for the degree of Doctor of Philosophy.

Teaching Requirement

Because one of the characteristics of a good researcher and scholar is the ability to express ideas and concepts to a broader audience in a clear manner, each doctoral candidate will be required to organize and deliver a series of lectures or recitations in the CEIE Department to undergraduate students. Arrangements for the teaching requirement are made between the student and his or her advisor and will include a minimum of 21 hours of classroom contact time between the time the student passes the qualifying exams and defends the dissertation proposal.

Total: 72 credits

■ Computer Science

Phone: 703-993-1530
Web: cs.gmu.edu

School: Volgenau School of Engineering
Faculty

Professors: Barbara, J. Chen, DeJong, Gomaa, Kerschberg, Menascé, Motro, Offutt, Pullen, Setia (chair), Sood, Tecuci, Wechsler


Assistant professors: Allbeck, Dobolyi, Li, Lien, Lin, Malek, McCoy, Rangwala, Shehu, Sousa, Snyder, Srinivasan, Stavrou

Adjunct professors: Abdulla, Alazawee, Armour, Baldo, Curts, Dubey, Ellis, Foxwell, Geldon, Howard, Hwang, Jabbour, Kodali, M. Maddox, Martin, Nidiffer, Pettit, Reveille, Sharif, Smeltzer, Tompkins, Wheeler

Emeritus faculty: Baum, Hamburger, Rine, Sibley

Introduction

Computer science is at the center of the information revolution in the 21st century. Advanced computation tools and techniques are revolutionizing and transforming the way we work, play, communicate, collaborate, and conduct business. In addition, computation is creating new scientific and engineering fields; such as robotics, computational sciences, bioinformatics, and health informatics, to name a few. Computer science is a discipline concerned with the analysis, design, implementation, maintenance, and evolution of computer-based systems used in almost all walks of life.

Computer scientists must be well-grounded not only in the theory of computing, but also in its application to diverse application areas, for example, web-based applications, wireless networking, online computer game design, social networks, agent-based systems and e-commerce. Computer scientists must be capable of working closely with members of other professions associated with computing. Students who pursue this discipline will learn (1) theories of computation, analysis of algorithms, operating systems, and artificial intelligence; (2) communication and coordination via advanced computer networks; (3) storage, retrieval, and management of large databases; and (4) analysis, design, and implementation of reliable software systems.

Course Work

The Department of Computer Science (CS) offers courses designated CS, INFS, ISA and SWE in the Courses chapter of this catalog. The department offers undergraduate programs in computer science and applied computer science. A double major is offered in computer science and computer engineering. Students may also select a minor in computer science or software engineering. Several accelerated BS Computer Science/MS Programs are offered. Graduate programs offered are an MS in computer science, an MS in information security and assurance, an MS in information systems, an MS in software engineering, a PhD in computer science, and several graduate certificate programs. The department also participates in the PhD in Information Technology Program with the following concentrations: PhD study in information security and assurance, PhD study in information systems, and PhD study in software engineering.

Undergraduate Degree

Applied Computer Science, BS

Banner Code: VS-BS-ACS

School: Volgenau School of Engineering

Department: Computer Science
This program presents an innovative approach to the integration of computer science with other disciplines that require expertise in computing techniques. These disciplines do not merely use computing but create new and interesting problems for computer scientists.

Degree Requirements

For the BS ACS degree, students must complete 120 credits, including the University General Education requirements. The program requires foundation, core, and concentration courses as described below. These course requirements provide expertise in programming, computer systems, software requirements and modeling, formal methods, and analysis of algorithms.

ACS foundation courses (24 credits)

- CS 101 - Preview of Computer Science Credits: 2
- CS 105 - Computer Ethics and Society Credits: 1
- CS 112 - Introduction to Computer Programming Credits: 4
- CS 211 - Object-Oriented Programming Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 203 - Linear Algebra Credits: 3

ACS core (22 credits)

- ECE 301 - Digital Electronics Credits: 3
- CS 262 - Introduction to Low-Level Programming Credits: 1
- CS 310 - Data Structures Credits: 3
- CS 321 - Software Requirements and Design Modeling Credits: 3
- CS 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- CS 465 - Computer Systems Architecture Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3

ACS elective (3 credits)

- One CS course numbered above 400.

Concentration (71 credits)

▲ Concentration in Bioinformatics (BNF)
Foundation (17 credits)

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- CHEM 201 - Introductory Chemistry I Credits: 3
- BIOL 213 - Cell Structure and Function Credits: 4
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Core (19 credits)

- BINF 450 - Bioinformatics for Life Sciences Credits: 4
- BIOL 482 - Introduction to Molecular Genetics Credits: 3
- BIOL 580 - Computer Applications for the Life Sciences Credits: 3
- CS 450 - Database Concepts Credits: 3
- BINF 401 - Bioinformatics and Computational Biology I Credits: 3  OR  CS 444 - Introduction to Computational Biology Credits: 3
- BINF 402 - Bioinformatics and Computational Biology II Credits: 3  OR  CS 445 - Computational Methods for Genomics Credits: 3

Two approved electives related to bioinformatics (6 credits)

A list of relevant courses can be obtained from the department office.

Additional University General Education (24 credits)

- Written Communication: 6 credits
- COMM 100 - Public Speaking Credits: 3
- Literature: 3 credits
- Arts: 3 credits
- Western Civilization/World History: 3 credits
- Social and Behavioral Science: 3 credits
- Global Understanding: 3 credits

Electives (5 credits)

▲ Concentration in Computer Game Design (CGDS)
Foundation (19 credits)

- CS 225 - Culture and Theory of Games Credits: 3
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
- CS 325 - Introduction to Game Design Credits: 3
- CS 351 - Visual Computing Credits: 3
- AVT 104 - Studio Fundamentals I Credits: 4
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Core (17 credits)

- CS 425 - Game Programming I Credits: 3
- CS 426 - Game Programming II Credits: 3
- CS 451 - Computer Graphics Credits: 3
- AVT 382 - 2D Experimental Animation Credits: 4
- AVT 383 - 3D Experimental Animation Credits: 4

One approved elective related to game design (3 credits)

Choose one course from the following:

- CS 332 - Object-Oriented Software Design and Implementation Credits: 3
- CS 455 - Computer Communications and Networking Credits: 3
- CS 475 - Concurrent and Distributed Systems Credits: 3
- CS 480 - Introduction to Artificial Intelligence Credits: 3
- CS 485 - Autonomous Robotics Credits: 3
- SWE 432 - Design and Implementation of Software for the Web Credits: 3
- GAME 332 - Story Design for Computer Games Credits: 3
- AVT 370 - Entrepreneurship in the Arts Credits: 4
- AVT 374 - Sound Art I Credits: 4
- AVT 487 - Advanced Topics: New Media Art Credits: 4

Natural Science (8 credits)

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- One additional lab science Credits: 4

Additional University General Education (21 credits)
• Written communication: 6 credits
• COMM 100 - Public Speaking Credits: 3
• Literature: 3 credits
• Western Civilization/World History: 3 credits
• Social and Behavioral Science: 3 credits
• Global Understanding: 3 credits

Electives (3 credits)

▲ Concentration in Geography (GEOG)

Foundation (21 credits)

• CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
• GGS 101 - Major World Regions Credits: 3
• GGS 102 - Physical Geography Credits: 3
• GGS 103 - Human Geography Credits: 3
• GGS 110 - Maps and Mapping Credits: 3
• GGS 300 - Quantitative Methods for Geographical Analysis Credits: 3
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Core (22 credits)

• GGS 310 - Introduction to Digital Cartography Credits: 4
• GGS 311 - Introduction to Geographic Information Systems Credits: 3
• GGS 411 - Advanced Digital Cartography Credits: 3
• GGS 412 - Air Photography Interpretation Credits: 3
• GGS 416 - Satellite Image Analysis Credits: 3
• GGS 463 - Applied Geographic Information Systems Credits: 3
• One GGS course numbered above 300 Credits: 3

Additional University General Education (22 credits)

• Written Communication: 6 credits
• COMM 100 - Public Speaking Credits: 3
• Literature: 3 credits
• Arts: 3 credits
• Western Civilization/World History: 3 credits
• Lab Science: 4 credits

Electives (6 credits)

▲ Concentration in Software Engineering (SWE)

Foundation (6 credits)

• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
• CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3

Core (10 credits)

• SWE 205 - Software Usability Analysis and Design Credits: 3
• SWE 301 - Internship Preparation Credits: 0
• SWE 401 - Internship Reflection Credits: 1
• CS 332 - Object-Oriented Software Design and Implementation Credits: 3
• SWE 437 - Software Testing and Maintenance Credits: 3

SWE related (15 credits) chosen from:

• CS 363 - Comparative Programming Languages Credits: 3
• CS 455 - Computer Communications and Networking Credits: 3
• CS 450 - Database Concepts Credits: 3
• CS 468 - Secure Programming and Systems Credits: 3
• CS 471 - Operating Systems Credits: 3
• CS 475 - Concurrent and Distributed Systems Credits: 3
• SWE 432 - Design and Implementation of Software for the Web Credits: 3
• SWE 443 - Software Architectures Credits: 3

Cross-disciplinary (6 credits)

• ENGH 388 - Professional and Technical Writing Credits: 3
• PSYC 333 - Industrial and Organizational Psychology Credits: 3  OR  COMM 320 - Business and Professional Communication Credits: 3  OR  COMM 335 - Organizational Communication Credits: 3

Additional University General Education (31 credits)

• Written Communication: 6 credits
• COMM 100 - Public Speaking Credits: 3
• Literature: 3 credits
• Arts: 3 credits
• Western Civilization/World History: 3 credits
• Social and Behavioral Science: 3 credits
• Global Understanding: 3 credits
• Natural Science: 7 credits

Electives (3 credits)

Total: 120 credits

Sample Schedules

Students should consult the sample schedules below and ensure that course prerequisites are satisfied. Students should obtain computer-generated audits periodically to ensure that degree requirements are being met.

Students must take CS 101 within their first year at the university. Students should take CS 105 during their second semester. A grade of C or better must be earned in CS 306 for this course to satisfy the university general education synthesis requirement. MATH 104, 105 and 108 cannot be counted towards the degree.

Bioinformatics (BNF) Concentration Sample Schedule

First Semester Credits: 16

• Western civilization course  Credits: 3
• CS 101 - Preview of Computer Science Credits: 2
• CS 112 - Introduction to Computer Programming Credits: 4
• ENGH 101 - Composition Credits: 3
• MATH 113 - Analytic Geometry and Calculus I Credits: 4
Second Semester Credits: 14

- CS 105 - Computer Ethics and Society Credits: 1
- CS 211 - Object-Oriented Programming Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 125 - Discrete Mathematics I Credits: 3
- COMM 100 - Public Speaking Credits: 3

Third Semester Credits: 14

- Elective Credits: 3
- CS 262 - Introduction to Low-Level Programming Credits: 1
- CS 310 - Data Structures Credits: 3
- ECE 301 - Digital Electronics Credits: 3
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1

Fourth Semester Credits: 15

- Literature Credits: 3
- CS 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- MATH 203 - Linear Algebra Credits: 3
- CHEM 201 - Introductory Chemistry I Credits: 3

Fifth Semester Credits 15

- Social and behavioral science course Credits: 3
- Elective Credits: 2
- CS 321 - Software Requirements and Design Modeling Credits: 3
- CS 465 - Computer Systems Architecture Credits: 3
- BIOL 213 - Cell Structure and Function Credits: 4

Sixth Semester Credits: 15

- Arts course Credits: 3
- BIOL 482 - Introduction to Molecular Genetics Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3
Seventh Semester Credits: 16

- Bioinformatics related elective Credits: 3
- Global understanding course Credits: 3
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
- CS 444 - Introduction to Computational Biology Credits: 3
- BINF 450 - Bioinformatics for Life Sciences Credits: 4

Eighth Semester Credits: 15

- Bioinformatics related elective Credits: 3
- CS Senior course Credits: 3
- BIOL 580 - Computer Applications for the Life Sciences Credits: 3
- CS 450 - Database Concepts Credits: 3
- CS 445 - Computational Methods for Genomics Credits: 3

Computer Game Design (CGDS) Concentration Sample Schedule

First Semester Credits: 16

- CS 101 - Preview of Computer Science Credits: 2
- CS 112 - Introduction to Computer Programming Credits: 4
- ENGH 101 - Composition Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- COMM 100 - Public Speaking Credits: 3

Second Semester Credits: 15

- AVT 104 - Studio Fundamentals I Credits: 4
- CS 105 - Computer Ethics and Society Credits: 1
- CS 211 - Object-Oriented Programming Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 125 - Discrete Mathematics I Credits: 3

Third Semester Credits: 16

- Social and behavioral science course Credits: 3
• CS 225 - Culture and Theory of Games Credits: 3
• CS 262 - Introduction to Low-Level Programming Credits: 1
• CS 310 - Data Structures Credits: 3
• ECE 301 - Digital Electronics Credits: 3
• MATH 203 - Linear Algebra Credits: 3

Fourth Semester Credits: 15

• Literature elective Credits: 3
• Western civilization course Credits: 3
• CS 325 - Introduction to Game Design Credits: 3
• CS 351 - Visual Computing Credits: 3
• CS 367 - Computer Systems and Programming Credits: 3

Fifth Semester Credits: 14

• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• AVT 382 - 2D Experimental Animation Credits: 4
• CS 321 - Software Requirements and Design Modeling Credits: 3
• CS 330 - Formal Methods and Models Credits: 3

Sixth Semester Credits: 14

• Lab science Credits: 4
• AVT 383 - 3D Experimental Animation Credits: 4
• CS 451 - Computer Graphics Credits: 3
• ENGH 302 - Advanced Composition Credits: 3

Seventh Semester Credits: 15

• Global understanding course Credits: 3
• Elective Credits: 3
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
• CS 425 - Game Programming I Credits: 3
• CS 465 - Computer Systems Architecture Credits: 3

Eighth Semester Credits: 15

• CS Senior course Credits: 3
• Game elective Credits: 3
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
- CS 426 - Game Programming II Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3

Geography (GEOG) Concentration Sample Schedule

First Semester Credits: 16

- CS 101 - Preview of Computer Science Credits: 2
- CS 112 - Introduction to Computer Programming Credits: 4
- ENGH 101 - Composition Credits: 3
- GGS 102 - Physical Geography Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Second Semester Credits: 14

- COMM 100 - Public Speaking Credits: 3
- CS 105 - Computer Ethics and Society Credits: 1
- CS 211 - Object-Oriented Programming Credits: 3
- GGS 103 - Human Geography Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

Third Semester Credits: 16

- Western civilization course Credits: 3
- CS 262 - Introduction to Low-Level Programming Credits: 1
- CS 310 - Data Structures Credits: 3
- GGS 101 - Major World Regions Credits: 3
- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 203 - Linear Algebra Credits: 3

Fourth Semester Credits: 16

- Arts course Credits: 3
- Natural science course Credits: 4
- ECE 301 - Digital Electronics Credits: 3
- GGS 110 - Maps and Mapping Credits: 3
- GGS 311 - Introduction to Geographic Information Systems Credits: 3
Fifth Semester Credits 15

- Literature course Credits: 3
- CS 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- GGS 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GGS 412 - Air Photography Interpretation Credits: 3

Sixth Semester Credits: 16

- Elective Credits: 3
- CS 321 - Software Requirements and Design Modeling Credits: 3
- GGS 310 - Introduction to Digital Cartography Credits: 4
- GGS 416 - Satellite Image Analysis Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Seventh Semester Credits: 15

- GGS Senior course Credits: 3
- CS 465 - Computer Systems Architecture Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
- GGS 411 - Advanced Digital Cartography Credits: 3

Eighth Semester Credits: 12

- CS Senior course Credits: 3
- Electives Credits: 3
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
- GGS 463 - Applied Geographic Information Systems Credits: 3

Software Engineering (SWE) Concentration Sample Schedule

First Semester Credits: 16

- Western civilization course Credits: 3
- CS 101 - Preview of Computer Science Credits: 2
- CS 112 - Introduction to Computer Programming Credits: 4
- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- ENGH 101 - Composition Credits: 3
Second Semester Credits: 14

- COMM 100 - Public Speaking Credits: 3
- CS 105 - Computer Ethics and Society Credits: 1
- CS 211 - Object-Oriented Programming Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 125 - Discrete Mathematics I Credits: 3

Third Semester Credits: 14

- Natural science course Credits: 4
- CS 262 - Introduction to Low-Level Programming Credits: 1
- CS 310 - Data Structures Credits: 3
- ECE 301 - Digital Electronics Credits: 3
- MATH 203 - Linear Algebra Credits: 3

Fourth Semester Credits: 15

- Literature course Credits: 3
- Natural science course Credits: 3
- CS 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- SWE 205 - Software Usability Analysis and Design Credits: 3

Fifth Semester Credits: 15

- SWE Cross disciplinary course Credits: 3
- Social and behavioral science course Credits: 3
- CS 321 - Software Requirements and Design Modeling Credits: 3
- CS 332 - Object-Oriented Software Design and Implementation Credits: 3
- ENGH 302 - Advanced Composition Credits: 3

Sixth Semester Credits: 15

- SWE related course Credits: 3
- Fine arts course Credits: 3
- Global understanding course Credits: 3
- SWE 437 - Software Testing and Maintenance Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- SWE 301 - Internship Preparation Credits: 0
Seventh Semester Credits: 16

- SWE related course Credits: 3
- SWE related course Credits: 3
- Elective Credits: 3
- CS 465 - Computer Systems Architecture Credits: 3
- ENGH 388 - Professional and Technical Writing Credits: 3
- SWE 401 - Internship Reflection Credits: 1

Eighth Semester Credits: 15

- SWE related course Credits: 3
- SWE related course Credits: 3
- CS Senior course Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3

Writing-Intensive Requirement

Computer science majors complete the writing-intensive requirement through a sequence of projects and reports in CS 306 and CS 321. Faculty members provide feedback on students' expository writing.

Repeating Courses

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course. This policy does not apply to STAT 250, which follows the normal university policy for repeating undergraduate courses.

Termination from the Major

No math, science, or Volgenau School of Engineering course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Communication

BS ACS majors must take COMM 100 - Public Speaking to satisfy the general education communication requirement.

Change of Major

Students requesting a change of major to computer science must have a GPA of at least 2.75 and successfully completed CS 112 or CS 211 and MATH 113, MATH 114, or MATH 125.
Advanced Placement, Credit by Exam

Some students may receive credit for CS 112 by passing departmentally administered exams. In addition, a score of 3 on the Advanced Placement (AP) computer science exam qualifies students for credit in CS 112. An AP score of 5, together with demonstrated competence in the programming language used in CS 211, qualifies students for credit in CS 211. A score of 4 on the International Baccalaureate (IB) computer science exam qualifies students for credits in CS 112, and a score of 5 or more qualifies students for credit in CS 211.

Grades

Students must earn a C or better in any course intended to satisfy a prerequisite for a computer science course. Computer science majors may not use more than one course with grade of C- or lower toward department requirements.

Computer Science, BS

Banner Code: VS-BS-CS

School: Volgenau School of Engineering

Department: Computer Science

The objectives of the BS in Computer Science Program relate to the abilities of the graduates several years after graduation. The objectives include:

- Foundation for successful careers in industry: Graduates of the program will have a broad understanding of the fundamental concepts, methodologies, tools, and applications of computer science. They will have the educational foundation that leads to successful careers in the computing industry.
- Foundation for graduate study: Graduates of the program will have the academic preparation for successful completion of rigorous graduate programs.
- Professional preparation: Graduates will have effective written and oral communication skills, and be able to work collaboratively in a professional and ethical manner.

This bachelor’s degree program is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org.

Degree Requirements

For the BS CS degree, students must complete 120 credits, including the University General Education requirements and all of the following:

Computer science core (35 credits)

- CS 101 - Preview of Computer Science Credits: 2
- CS 105 - Computer Ethics and Society Credits: 1
- CS 112 - Introduction to Computer Programming Credits: 4
- CS 211 - Object-Oriented Programming Credits: 3
- CS 262 - Introduction to Low-Level Programming Credits: 1
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
- CS 310 - Data Structures Credits: 3
• CS 321 - Software Requirements and Design Modeling Credits: 3
• CS 330 - Formal Methods and Models Credits: 3
• CS 367 - Computer Systems and Programming Credits: 3
• CS 465 - Computer Systems Architecture Credits: 3
• CS 483 - Analysis of Algorithms Credits: 3
• ECE 301 - Digital Electronics Credits: 3

Note:

Students must take CS 101 within their first year at the university. Students should take CS 105 during their second semester. A grade of C or better must be earned in CS 306 for this course to satisfy the university general education synthesis requirement.

Senior computer science (12 credits)

Any four of the following:

• CS 425 - Game Programming I Credits: 3
• CS 440 - Language Processors and Programming Environments Credits: 3
• CS 450 - Database Concepts Credits: 3
• CS 451 - Computer Graphics Credits: 3
• CS 455 - Computer Communications and Networking Credits: 3
• CS 468 - Secure Programming and Systems Credits: 3
• CS 471 - Operating Systems Credits: 3
• CS 475 - Concurrent and Distributed Systems Credits: 3
• CS 480 - Introduction to Artificial Intelligence Credits: 3
• CS 482 - Computer Vision Credits: 3
• CS 484 - Data Mining Credits: 3
• CS 499 - Special Topics in Computer Science Credits: 3

Note:

Only three credits of CS 499 can be used toward the Senior computer science requirement.

Mathematics (20 credits)

• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• MATH 125 - Discrete Mathematics I Credits: 3
• MATH 203 - Linear Algebra Credits: 3
• MATH 213 - Analytic Geometry and Calculus III Credits: 3
• MATH 446 - Numerical Analysis I Credits: 3  OR  OR 481 - Numerical Methods in Engineering Credits: 3

Note:
MATH 104, 105 and 108 cannot be counted toward this degree.

Statistics (3 credits)

- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Computer science-related courses (6 credits)

Two courses chosen from:

- STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3
- OR 335 - Discrete Systems Modeling and Simulation Credits: 3
- OR 441 - Deterministic Operations Research Credits: 3
- OR 442 - Stochastic Operations Research Credits: 3
- ECE 280 - Electric Circuit Analysis Credits: 5
- ECE 431 - Digital Circuit Design Credits: 3
- ECE 447 - Single-Chip Microcomputers Credits: 4
- ECE 450 - Introduction to Robotics Credits: 3
- ECE 511 - Microprocessors Credits: 3
- SWE 432 - Design and Implementation of Software for the Web Credits: 3
- SWE 437 - Software Testing and Maintenance Credits: 3
- SWE 443 - Software Architectures Credits: 3
- SYST 371 - Systems Engineering Management Credits: 3
- SYST 470 - Human Factors Engineering Credits: 3
- PHIL 371 - Philosophy of Natural Sciences Credits: 3
- ENGH 388 - Professional and Technical Writing Credits: 3
- Any MATH or CS course numbered above 300 (except MATH 351) Credits: 3
- PHIL 376 - Symbolic Logic Credits: 3

Note:

Students may need to choose electives to satisfy prerequisites for these courses. Those planning to take MATH 352 may replace STAT 344 with MATH 351.

Natural Science (12 credits)

The BS in Computer Science requires 12 credits of natural science. The courses should be intended for science and engineering students and must include a two course sequence with laboratories. Some approved combinations have a total of more than 12 hours. Approved two course sequences with laboratories are:

Astronomy:

- ASTR 111 - Introductory Astronomy: The Solar System Credits: 3 AND ASTR 112 - Introductory Astronomy Lab: The Solar System Credits: 1
- ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe Credits: 3 AND ASTR 114 - Introductory Astronomy Lab: Stars, Galaxies, and the Universe Credits: 1
**Biology:**
- BIOL 103 - Introductory Biology I Credits: 4 AND BIOL 104 - Introductory Biology II Credits: 4

**Chemistry:**
- CHEM 211 - General Chemistry Credits: 4 AND CHEM 212 - General Chemistry Credits: 4

**Environmental Science:**
- EVPP 110 - The Ecosphere: An Introduction to Environmental Science I Credits: 4 AND EVPP 111 - The Ecosphere: An Introduction to Environmental Science II Credits: 4

**Geology:**
- GEOL 101 - Introductory Geology I Credits: 4 AND GEOL 102 - Introductory Geology II Credits: 4

**Physics:**
- PHYS 160 - University Physics I Credits: 3 AND PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3 AND PHYS 261 - University Physics II Laboratory Credits: 1

**Communication (3 credits)**
- COMM 100 - Public Speaking Credits: 3
  
  Computer Science students must make a technical presentation. This course fulfills the general education requirement in oral communication for Volgenau School students.

**Additional Humanities (3 credits)**

Students must complete three additional credits of Humanities courses. This can be fulfilled by any University General Education course except those listed under Information Technology, Synthesis, Quantitative Reasoning, or Natural Science. Students wishing to substitute alternate courses for this requirement must obtain departmental approval.

**Additional University General Education (21 credits)**

Students must complete all University General Education requirements not fulfilled by major requirements.

- Written Communication: 6 credits
- Literature: 3 credits
- Arts: 3 credits
- Western Civilization/World History: 3 credits
- Social and Behavioral Science: 3 credits
- Global Understanding: 3 credits

**Electives (5 credits)**

Students must complete 5 elective credits.

**Total: 120 credits**
Sample Schedule

Students should consult the sample schedule below and ensure that course prerequisites are satisfied. Students should obtain computer-generated audits periodically to ensure that degree requirements are being met.

First Semester Credits: 16

- Western civilization course Credits: 3
- CS 101 - Preview of Computer Science Credits: 2
- CS 112 - Introduction to Computer Programming Credits: 4
- ENGH 101 - Composition Credits: 3
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Second Semester Credits: 14

- Arts course Credits: 3
- Literature course Credits: 3
- CS 105 - Computer Ethics and Society Credits: 1
- CS 211 - Object-Oriented Programming Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4

Third Semester Credits: 14

- Natural science course Credits: 4
- Social and behavioral science course Credits: 3
- CS 262 - Introduction to Low-Level Programming Credits: 1
- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3

Fourth Semester Credits: 16

- Natural science course Credits: 4
- Elective Credits: 3
- COMM 100 - Public Speaking Credits: 3
- CS 310 - Data Structures Credits: 3
- ECE 301 - Digital Electronics Credits: 3

Fifth Semester Credits 15

- Global understanding course Credits: 3
- CS 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
• MATH 203 - Linear Algebra Credits: 3

Sixth Semester Credits: 16

• Humanities course Credits: 3
• Natural science course Credits: 4
• CS 321 - Software Requirements and Design Modeling Credits: 3
• CS 465 - Computer Systems Architecture Credits: 3
• STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3

Seventh Semester Credits: 15

• Senior computer science course Credits: 3
• Computer science-related elective Credits: 3
• CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3
• CS 483 - Analysis of Algorithms Credits: 3
• OR 481 - Numerical Methods in Engineering Credits: 3 OR MATH 446 - Numerical Analysis I Credits: 3

Eighth Semester Credits: 14

• Senior computer science course Credits: 3
• Senior computer science course Credits: 3
• Senior computer science course Credits: 3
• Computer science-related elective Credits: 3
• General elective Credits: 2

Change of Major

Students requesting a change of major to computer science must have a GPA of at least 2.75 and successfully completed CS 112 or CS 211 and MATH 113, MATH 114 or MATH 125.

Repeating Courses

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course. This policy does not apply to STAT 250, which follows the normal university policy for repeating undergraduate courses.

Termination from the Major

No math, science, or Volgenau School of Engineering course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Advanced Placement, Credit by Exam
Some students may receive credit for CS 112 by passing departmentally administered exams. In addition, a score of 3 on the Advanced Placement (AP) computer science exam qualifies the student for credit in CS 112. An AP score of 5, together with demonstrated competence in the programming language used in CS 211, qualifies students for credit in CS 211. A score of 4 on the International Baccalaureate (IB) computer science exam qualifies students for credit in CS 112, and a score of 5 or more qualifies students for credit in CS 211.

Writing-Intensive Requirement

Computer science majors complete the writing-intensive requirement through a sequence of projects and reports in CS 306 and CS 321. Faculty members provide feedback on students' expository writing.

Grades

Students must earn a C or better in any course intended to satisfy a prerequisite for a computer science course. Computer science majors may not use more than one course with grade of C- or lower toward department requirements.

Cooperative Education

Students may participate in the Mason cooperative education program or a work-study program in the Washington, D.C. area.

Computer Science, Computer Engineering Double Major

Computer science majors can earn a double major in computer science and computer engineering if they complete an additional 28 credits of courses beyond the 120 credits required for the computer science degree. The additional 28 credits must be part of an approved plan of study. For more information, visit the department web site.

Bachelor's Level Certificate

Computer Science Undergraduate Certificate

Banner Code: VS-CERB-CS

School: Volgenau School of Engineering

Department: Computer Science

This certificate targets students who are working on or possess an undergraduate degree in a technical (science or engineering) field but lack a formal credential in the computer science field. The certificate also targets students who have shown an aptitude for graduate study but do not have the academic prerequisites required for admittance into a graduate MS computer science program.

The undergraduate certificate in computer science may be pursued on a full-time basis except when limited by prerequisite constraints.

Admissions Requirements
Students must have programming experience at the level of CS 112 and CS 211, and either a BS in a technical field with a 3.00 GPA or higher, or current enrollment in a technical undergraduate major.

Certificate Requirements

Basic Computer Science (15 credits)

- CS 310 - Data Structures Credits: 3
- CS 330 - Formal Methods and Models Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- CS 465 - Computer Systems Architecture Credits: 3
- ECE 301 - Digital Electronics Credits: 3

Mathematics (6 credits)

- MATH 125 - Discrete Mathematics I Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3

Completion of one of the following options (9 credits):

Option 1:

- CS 483 - Analysis of Algorithms Credits: 3

AND two of the following:

- CS 321 - Software Requirements and Design Modeling Credits: 3
- CS 440 - Language Processors and Programming Environments Credits: 3
- CS 450 - Database Concepts Credits: 3
- CS 451 - Computer Graphics Credits: 3
- CS 455 - Computer Communications and Networking Credits: 3
- CS 468 - Secure Programming and Systems Credits: 3
- CS 471 - Operating Systems Credits: 3
- CS 480 - Introduction to Artificial Intelligence Credits: 3
- CS 484 - Data Mining Credits: 3
Option 2:

- CS 583 - Analysis of Algorithms Credits: 3

AND two of the following:

- CS 540 - Language Processors Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3

Total: 30 Credits

Undergraduate Minor

Computer Science Minor

Banner Code: CS

School: Volgenau School of Engineering

Department: Computer Science

The minor in computer science requires completion of at least 17 credits. Students should pay careful attention to prerequisites when selecting courses.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Work

Required Courses (10 credits)

- CS 112 - Introduction to Computer Programming Credits: 4
- CS 211 - Object-Oriented Programming Credits: 3
- CS 310 - Data Structures Credits: 3
One of the following (1-3 credits)

- CS 105 - Computer Ethics and Society Credits: 1
- CS 306 - Synthesis of Ethics and Law for the Computing Professional Credits: 3

Two additional computer science courses (6 credits) chosen from:

- CS 321 - Software Requirements and Design Modeling Credits: 3
- CS 325 - Introduction to Game Design Credits: 3
- CS 330 - Formal Methods and Models Credits: 3
- CS 332 - Object-Oriented Software Design and Implementation Credits: 3
- CS 363 - Comparative Programming Languages Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3
- CS 450 - Database Concepts Credits: 3
- CS 451 - Computer Graphics Credits: 3
- CS 455 - Computer Communications and Networking Credits: 3
- CS 465 - Computer Systems Architecture Credits: 3
- CS 468 - Secure Programming and Systems Credits: 3
- CS 471 - Operating Systems Credits: 3
- CS 480 - Introduction to Artificial Intelligence Credits: 3
- CS 483 - Analysis of Algorithms Credits: 3
- CS 484 - Data Mining Credits: 3

Total: 17-19 credits

Software Engineering Minor

Banner Code: SWE

School: Volgenau School of Engineering

Department: Computer Science

For policies governing all minors, see the Academic Policies chapter of this catalog.

Course Requirements
Candidates for the minor in software engineering must complete 16 credits in software engineering with a minimum GPA of 2.00, 8 credits of which must be unique to the minor and not used for the major.

Students take:

- CS 112 - Introduction to Computer Programming Credits: 4

One of the following:

- CS 211 - Object-Oriented Programming Credits: 3
- CS 222 - Computer Programming for Engineers Credits: 3

And three from:

- SWE 205 - Software Usability Analysis and Design Credits: 3
- CS 321 - Software Requirements and Design Modeling Credits: 3
- CS 332 - Object-Oriented Software Design and Implementation Credits: 3
- SWE 432 - Design and Implementation of Software for the Web Credits: 3
- SWE 437 - Software Testing and Maintenance Credits: 3
- SWE 443 - Software Architectures Credits: 3

Total: 16 credits

**Bachelor's/Accelerated Master's Program**

**Computer Science, BS/Computer Science, Accelerated MS**

*School: Volgenau School of Engineering*

*Department: Computer Science*

This program is for those interested in immediately continuing on to graduate studies in computer science.

**Admission Requirements**

Students in a BS program in computer science or a related area may apply for the BS/accelerated MS program if they have earned 90 undergraduate credits with an overall GPA of at least 3.50. Criteria for admission are identical to criteria for admission to the MS program.
Degree Requirements

Students must complete 144 credits that satisfy requirements for the BS program and the MS program, with 6 credits overlap.

Students register for 6 credits of CS 500-level basic courses in place of the corresponding CS 400-level courses required for the undergraduate degree requirements. Specifically, students must register for two of the following courses in place of the corresponding 400-level courses:

- CS 540 - Language Processors Credits: 3
- CS 550 - Database Systems Credits: 3
- CS 551 - Computer Graphics Credits: 3
- CS 555 - Computer Communications and Networking Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3
- CS 583 - Analysis of Algorithms Credits: 3

Please note:

Students are permitted to take additional graduate basic courses in their undergraduate programs. In such cases, those classes cannot be counted toward requirements for the MS.

Degree Conferral

Students must apply to have the BS in computer science degree conferred the semester before they expect to complete the BS requirements. At the completion of the MS requirements, a master’s degree is granted.

Computer Science, BS/Information Security and Assurance, Accelerated MS

School: Volgenau School of Engineering

Department: Computer Science

This program is for students interested in immediately continuing their undergraduate studies in computer science with graduate studies in information security and assurance.

Admission Requirements

Students in the BS in Computer Science Program can apply for this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. Criteria for admission are identical to criteria for admission to the MS in Information Security and Assurance Program.

Degree Requirements

Students must complete 144 credits that satisfy requirements for the BS in Computer Science Program, as well as those for the MS in Information Security and Assurance Program, with 6 credits overlapping.
Students register for two of the following courses (6 credits of 500-level computer science core courses) in place of the corresponding 400-level computer science courses, as part of the undergraduate degree requirements.

- CS 540 - Language Processors Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3
- CS 583 - Analysis of Algorithms Credits: 3

Please note:

Students complete all MS in information security and assurance core courses and apply the two courses from the above list toward the MS in information security and assurance requirements.

Degree Conferral

Students must apply to have the BS in computer science degree conferred the semester before they expect to complete the BS requirements. At the completion of the MS in information security and assurance requirements, a master’s degree will be granted.

Computer Science, BS/Information Systems, Accelerated MS

School: Volgenau School of Engineering

Department: Computer Science

This program is for students interested in immediately continuing undergraduate studies in computer science with graduate studies in information systems.

Admission Requirements

Students in the BS in computer science program can apply to this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. Criteria for admission are identical to the criteria for admission to the MS in Information Systems Program.

Degree Requirements

Students must complete 144 credits that satisfy requirements for the BS in Computer Science Program, as well as those for the MS in Information Systems Program, with 6 credits overlap.

Students register for two of the following courses (6 credits of 500-level computer science core courses) in place of the corresponding 400-level computer science courses, as part of the undergraduate degree requirements.

- CS 540 - Language Processors Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3
- CS 583 - Analysis of Algorithms Credits: 3

Please note:
Students complete all MS in information systems core courses and apply the two courses from above toward the MS in information systems elective requirements.

Degree Conferral

Students must apply to have the BS in computer science degree conferred the semester before they expect to complete the BS requirements. At the completion of the MS in information systems requirements, a master’s degree is granted.

Computer Science, BS/Software Engineering, Accelerated MS

School: Volgenau School of Engineering

Department: Computer Science

This program is for students interested in immediately continuing undergraduate studies in computer science with graduate studies in software engineering.

Admission Requirements

Students in the BS in Computer Science Program can apply to this program if they have earned 90 undergraduate credits with an overall GPA of at least 3.30. Criteria for admission are identical to criteria for admission to the MS in Software Engineering Program.

Degree Requirements

Students must complete 144 credits that satisfy requirements for the BS in Computer Science Program, as well as those for the MS in Software Engineering Program, with 6 credits overlap.

Students register for two of the following courses (6 credits of 500-level computer science core courses) in place of the corresponding 400-level computer science courses, as part of the undergraduate degree requirements.

- CS 540 - Language Processors Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3
- CS 583 - Analysis of Algorithms Credits: 3

Please note:

Students complete all MS in software engineering core courses and apply the two courses from the above list toward the MS in software engineering elective requirements.

Degree Conferral

Students must apply to have the BS in computer science degree conferred the semester before they expect to complete the BS requirements. At the completion of the MS in software engineering requirements, a master’s degree is granted.

Master's Degree
Computer Science, MS

Banner Code: VS-MS-CS

School: Volgenau School of Engineering

Department: Computer Science

The graduate program leading to an MS in computer science prepares students for research and professional practice in computer science and related technologies. The program includes both fundamentals and advanced work in the areas of artificial intelligence and databases, programming languages and software engineering, systems and networks, theoretical computer science, and visual computing. Graduate classes are divided into basic classes, which have no graduate course prerequisite, and advanced classes, which have a graduate class as a prerequisite. Graduate classes are generally offered in the late afternoon and evening. Financial aid in the form of graduate assistantships may be available for full-time degree-seeking students.

Admission Requirements

In addition to fulfilling Mason’s admission requirements for graduate study, applicants must meet the following requirements:

- Hold a baccalaureate degree that includes Data Structures and Algorithms (CS 310), Automata Theory and Formal Languages (CS 330), and Computer Architecture including Assembly Language (CS 367 and CS 465). Students also must have completed Calculus I and II and a substantial course in discrete mathematics (such as MATH 125). Students with some deficiencies in preparation may be admitted provisionally pending completion of foundation courses in mathematics or computer science. Undergraduate credit earned for this purpose may not be applied toward the graduate degree.
- Earned a cumulative GPA of 3.00 for the last two years of undergraduate work, preferably with a major in a technical field such as computer science, mathematics, physical sciences, engineering, or information systems.
- Submit transcripts of all post secondary education, a self assessment form (included in the application package or available from the department), three letters of recommendation, and an official GRE score.

Degree Requirements (30 credits)

In addition to general university requirements, completion of the MS in CS program requires 30 credits of graduate courses.

Courses are grouped in the following five broad areas: Artificial Intelligence and Databases, Programming Languages and Software Engineering, Systems and Networks, Theoretical Computer Science, and Visual Computing. The list of preapproved courses with their areas is provided below.

All the following requirements should be satisfied for the MS in CS degree:

- CS 583 - Analysis of Algorithms Credits: 3 (from the Theoretical Computer Science area) and two additional core courses from two other areas must be successfully completed with a grade of B- or better.
- At least five courses (15 credits) must be chosen from the advanced courses in the list of preapproved courses from at least three different areas.
- At least six courses, including two advanced courses, must be designated CS.
- At least eight courses must be taken from the list of preapproved courses. Up to two computer science-related courses that are not on the list of preapproved courses may be taken with the approval of the Computer Science Department.

Plan of Study
Before the end of the second semester, students must have a plan of study approved by their academic advisor. This plan should be kept up to date by regular consultation with the academic advisor. A final signed version of the plan must be included when the student submits a graduation application.

Core Courses by Area

The following basic courses are designated as “core” courses in their respective areas:

Artificial Intelligence and Databases

- CS 550 - Database Systems Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3

Programming Languages and Software Engineering

- CS 540 - Language Processors Credits: 3
- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3

Systems and Networks

- CS 555 - Computer Communications and Networking Credits: 3
- CS 571 - Operating Systems Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3

Theoretical Computer Science

- CS 583 - Analysis of Algorithms Credits: 3

Visual Computing

- CS 551 - Computer Graphics Credits: 3

Preapproved Basic and Advanced MS CS Courses by Area
The preapproved courses are explicitly classified as “basic” or “advanced” below.

**Artificial Intelligence and Databases**

Basic Courses:
- CS 550 - Database Systems Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3
- INFS 623 - Web Search Engines and Recommender Systems Credits: 3

Advanced Courses:
- CS 650 - Advanced Database Management Credits: 3
- CS 659 - Theory and Applications of Data Mining Credits: 3
- CS 667 - Biometrics and Identity Management Credits: 3
- CS 680 - Natural Language Processing Credits: 3
- CS 681 - Designing Expert Systems Credits: 3
- CS 685 - Intelligent Systems for Robots Credits: 3
- CS 687 - Advanced Artificial Intelligence Credits: 3
- CS 688 - Pattern Recognition Credits: 3
- CS 689 - Planning Motions of Robots and Molecules Credits: 3
- CS 757 - Mining Massive Datasets Credits: 3
- CS 775 - Advanced Pattern Recognition Credits: 3
- CS 780 - Data Mining on Multimedia Data Credits: 3
- CS 782 - Machine Learning Credits: 3
- CS 785 - Knowledge Acquisition and Problem Solving Credits: 3
- CS 787 - Decision Guidance Systems Credits: 3
- CS 811 - Research Topics in Machine Learning and Inference Credits: 3
- CS 880 - Research Topics in Artificial Intelligence Credits: 3
- CS 884 - Advanced Topics in Computer Vision and Robotics Credits: 3
- INFS 740 - Database Programming for the World Wide Web Credits: 3
- INFS 760 - Advanced Database Management Credits: 3
- INFS 764 - Object-Oriented Database Systems Credits: 3
- INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
- INFS 774 - Enterprise Architecture Credits: 3
- ISA 765 - Database and Distributed Systems Security Credits: 3

**Programming Languages and Software Engineering**

Basic Courses:
- CS 540 - Language Processors Credits: 3
- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- SWE 620 - Software Requirements Analysis and Specification Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3
- SWE 622 - Distributed Software Engineering Credits: 3

Advanced Courses:
- CS 640 - Advanced Compilers Credits: 3
- ISA 640 - Programming Language Security Credits: 3
- ISA 681 - Secure Software Design Credits: 3
- SWE 623 - Formal Methods and Models in Software Engineering Credits: 3
- SWE 632 - User Interface Design and Development Credits: 3
- SWE 637 - Software Testing Credits: 3
- SWE 642 - Software Engineering for the World Wide Web Credits: 3
- SWE 645 - Component-Based Software Development Credits: 3
- SWE 720 - Advanced Software Requirements Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 727 - Quality of Service for Software Architectures Credits: 3

**Systems and Networks**

**Basic Courses:**
- CS 555 - Computer Communications and Networking Credits: 3
- CS 571 - Operating Systems Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3
- ISA 564 - Security Laboratory Credits: 3

**Advanced Courses:**
- CS 635 - Foundations of Parallel Computation Credits: 3
- CS 658 - Networked Virtual Environments Credits: 3
- CS 671 - Advanced Operating Systems Credits: 3
- CS 672 - Computer System Performance Evaluation Credits: 3
- CS 673 - Multimedia Computing and Systems Credits: 3
- CS 675 - Distributed Systems Credits: 3
- CS 706 - Concurrent Software Systems Credits: 3
- CS 719 - Scaling Technologies for E-business Credits: 3
- CS 755 - Advanced Computer Networks Credits: 3
- CS 756 - Performance Analysis of Computer Networks Credits: 3
- CS 773 - Real-Time Systems Design and Development Credits: 3
- CS 779 - Topics in Resilient and Secure Computer Systems Credits: 3
- CS 818 - Topics in Computer Systems Credits: 3
- ISA 656 - Network Security Credits: 3
- ISA 673 - Operating Systems Security Credits: 3
- ISA 674 - Intrusion Detection Credits: 3
- ISA 697 - Topics in Information Security Credits: 1-6
- ISA 763 - Security Protocol Analysis Credits: 3
- ISA 764 - Security Experimentation Credits: 3
- ISA 767 - Secure Electronic Commerce Credits: 3
- ISA 785 - Research in Digital Forensics Credits: 3

**Theoretical Computer Science**

**Basic Courses:**
- CS 583 - Analysis of Algorithms Credits: 3

**Advanced Courses:**
- CS 600 - Theory of Computation Credits: 3
- CS 611 - Computational Methods for Genomics Credits: 3
- CS 630 - Advanced Algorithms Credits: 3
• CS 633 - Computational Geometry Credits: 3
• CS 683 - Parallel Algorithms Credits: 3
• CS 684 - Graph Algorithms Credits: 3
• CS 735 - Concurrency Credits: 3
• CS 753 - Parallel Computation Credits: 3

Visual Computing

Basic Courses:
• CS 551 - Computer Graphics Credits: 3

Advanced Courses:
• CS 662 - Computer Graphics Game Technologies Credits: 3
• CS 667 - Biometrics and Identity Management Credits: 3
• CS 682 - Computer Vision Credits: 3
• CS 686 - Image Processing and Applications Credits: 3
• CS 752 - Interactive Graphics Software Credits: 3
• CS 774 - Computational Vision Credits: 3
• CS 776 - Graphical Real-Time Simulation Credits: 3
• CS 777 - Human-Computer Intelligent Interaction Credits: 3
• CS 884 - Advanced Topics in Computer Vision and Robotics Credits: 3

Project/Thesis (optional):

Three to six credit hours of the advanced classes may be replaced by a project or thesis. The project or thesis must be guided and approved by a committee of three appropriate faculty members and presented at an appropriate forum. The thesis must meet relevant university requirements.

• 3 credits of CS 798 - Project Seminar Credits: 3
  or
• 6 credits of CS 799 - Thesis Credits: 1-6

Note:

These courses are not classified by area. Note that CS 695/CS 795 can be used to satisfy the breadth requirement if the area is listed in the syllabus for the course.

• CS 695 - Topics in Computer Science Credits: 3
• CS 697 - Independent Reading and Research Credits: 1-3
• CS 795 - Advanced Topics in CS Credits: 3
• CS 798 - Project Seminar Credits: 3
• CS 799 - Thesis Credits: 1-6
• CS 895 - Research Topics in CS Credits: 3

Total: 30 credits
Information Security and Assurance, MS

Banner Code: VS-MS-ISA

School: Volgenau School of Engineering

Department: Computer Science

The Department of Computer Science’s master of science degree program in information security and assurance prepares graduates to fill the current and future need for information security and assurance professionals. Graduates work in a wide variety of capacities, protecting the information systems of different types of organizations and supporting the nation’s information infrastructure. The master of science in information security and assurance provides students with the general and technical knowledge and skills to understand the relationship between information security and advancing information systems technology. The program gives graduates a theoretical understanding of the science and methodologies for ensuring the secrecy and integrity of data, as well as the availability and legitimate use of data and information systems.

Students focus on the technical and management aspects of information security and examine ways to provide secure information processing systems by investigating operating systems security, distributed secure system architectures, database security, software applications security, security policies, secure e-commerce, network and distributed systems security, cryptography, and security protocols. Graduates of the program are actively recruited by federal, state, and local governments, as well as the private sector. Typical employers include Internet-based companies, software companies, banks and insurance companies, and in general any organization that depends heavily on the use of IT. All classes are scheduled in the late afternoon and early evening to accommodate employed students.

Admission Requirements

Applicants must hold a four-year (120-credit) baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or better in the last 60 credits. Other requirements are as follows:

- Show proof of a satisfactory score on the GRE, if required. The applicable test should have been taken within five years of applying for admission. The department policy is that the GRE is required unless the applicant has an undergraduate degree in science or engineering from a U.S. university and graduated with a GPA of 3.00 or better in the last 60 hours; a graduate degree in science or engineering from a U.S. university; or been admitted as a non degree student and meets all the following requirements: an undergraduate degree from a U.S. university, an undergraduate GPA of 3.00 or better in the last 60 hours, and a B in all foundation courses taken at Mason or elsewhere.
- Submit the appropriate application forms with three letters of recommendation from people directly knowledgeable of the applicant’s professional and academic competence, a one-page goals statement, and a work résumé.
- Submit a department self-evaluation form that is essential for evaluating foundation requirements by the department faculty. This form may be obtained from the department office or the department web page.
- International students must submit their TOEFL score.

Foundation Requirements

To ensure that students have an adequate background in mathematical methods and computer technology, the program requires the following four foundation courses, or their equivalents: INFS 501 Discrete and Logical Structures for Information Systems, INFS 515 Computer Organization, INFS 519 Program Design and Data Structures, and SWE 510 Object-Oriented Programming in Java.

Prospective students are asked to complete a department self evaluation form, indicating whether previously taken courses may satisfy these foundation requirements. On acceptance, students are advised of the necessary foundation courses to be
satisfactorily completed to meet this requirement. Foundation courses do not earn credit toward the MS degree; however, they must be successfully completed with a grade of B or better before enrolling in the core curriculum.

Students may test out to indicate that they have the requisite knowledge for those foundations of INFS 501, 515, and 519. The exams are given before classes begin in January and August, and can only be taken once. Registration is not required; students need only be present at the date, time, and location specified with some form of photographic identification. Detailed information is available on the department web site. Students failing any one of the exams must take the equivalent course before enrolling in the core curriculum courses.

Advising

The department holds orientation meetings each January and August to advise newly admitted and continuing students. Members of the faculty are present to answer questions and offer advice concerning programs of study. Detailed information is available on the department web site.

The department also provides an advising function to students, as outlined in the student advising form available from the department. Each student is assigned a faculty advisor with whom to confer on matters related to degree requirements. A plan of study form for the MS degree should be completed and submitted by the student soon after admission to the program. This serves as a planning guide for the student.

Degree Requirements

Completion of the degree program requires a minimum of 30 approved graduate credits (ten courses). Students may choose an emphasis area by selecting four elective courses from one of the two optional concentration areas as specified below. To continue in the program, students are required to obtain a B- or better grade in the core courses.

Required Core Courses (12 credits):

To provide the necessary background and fundamentals of information systems security and assurance, the program has four courses that are required of all students:

- ISA 562 - Information Security Theory and Practice Credits: 3
- ISA 564 - Security Laboratory Credits: 3
- ISA 656 - Network Security Credits: 3
- INFS 612 - Principles and Practices of Communication Networks Credits: 3

Security Elective Courses (12 credits):

Students select four courses from the following list of courses. Students may alternatively satisfy this requirement by completing a concentration.

- ISA 563 - Fundamentals of Systems Programming Credits: 3
- ISA 640 - Programming Language Security Credits: 3
- ISA 650 - Security Policy Credits: 3
- ISA 652 - Security Audit and Compliance Testing Credits: 3
- ISA 673 - Operating Systems Security Credits: 3
- ISA 674 - Intrusion Detection Credits: 3
- ISA 681 - Secure Software Design Credits: 3
- ISA 763 - Security Protocol Analysis Credits: 3
- ISA 764 - Security Experimentation Credits: 3
- ISA 765 - Database and Distributed Systems Security Credits: 3
- ISA 767 - Secure Electronic Commerce Credits: 3
- ISA 785 - Research in Digital Forensics Credits: 3
- CS 667 - Biometrics and Identity Management Credits: 3
- CS 779 - Topics in Resilient and Secure Computer Systems Credits: 3

Optional Concentration Areas (12 credits):

In place of the 12 credit hours of security elective courses students may pursue a concentration by completing four courses from one of the two options below.

▲ Network and System Security Concentration (NSS)

- CS 555 - Computer Communications and Networking Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 779 - Topics in Resilient and Secure Computer Systems Credits: 3
- ISA 563 - Fundamentals of Systems Programming Credits: 3
- ISA 640 - Programming Language Security Credits: 3
- ISA 673 - Operating Systems Security Credits: 3
- ISA 674 - Intrusion Detection Credits: 3
- ISA 681 - Secure Software Design Credits: 3
- ISA 763 - Security Protocol Analysis Credits: 3
- ISA 764 - Security Experimentation Credits: 3

▲ Advanced Cyber Security Concentration (ACYB)

- CS 667 - Biometrics and Identity Management Credits: 3
- ISA 650 - Security Policy Credits: 3
- ISA 652 - Security Audit and Compliance Testing Credits: 3
- ISA 763 - Security Protocol Analysis Credits: 3
- ISA 765 - Database and Distributed Systems Security Credits: 3
- ISA 767 - Secure Electronic Commerce Credits: 3
- ISA 862 - Models for Computer Security Credits: 3
- ISA 863 - Advanced Topics in Computer Security Credits: 3

Note:

MS ISA students who want to take CS 571 but have not taken CS 367 or equivalent, are advised to take ISA 563 before CS 571.

CS 555 can be used as a substitute for INFS 612. However, CS 555 and INFS 612 cannot both be counted toward the MS ISA degree.
Two Additional Courses (6 credits):

All students must select the remaining two courses from any combination of the following:

- ISA courses at the 600 and 700 level (with the exception of ISA 685)
- CS courses at the 500, 600, and 700 level
- Courses from the list of preapproved electives provided below
- A thesis option is available whereby a student may elect to complete a 6-credit thesis ISA 799.

Students may choose other graduate electives with the consent of their faculty advisor and the graduate coordinator.

Approved Electives

A full list of pre-approved electives is given below by program:

Information Systems (INFS)

- INFS 614 - Database Management Credits: 3
- INFS 623 - Web Search Engines and Recommender Systems Credits: 3
- INFS 740 - Database Programming for the World Wide Web Credits: 3
- INFS 755 - Data Mining Credits: 3
- INFS 760 - Advanced Database Management Credits: 3
- INFS 764 - Object-Oriented Database Systems Credits: 3
- INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
- INFS 774 - Enterprise Architecture Credits: 3

Software Engineering (SWE)

- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- SWE 620 - Software Requirements Analysis and Specification Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3
- SWE 622 - Distributed Software Engineering Credits: 3
- SWE 623 - Formal Methods and Models in Software Engineering Credits: 3
- SWE 632 - User Interface Design and Development Credits: 3
- SWE 637 - Software Testing Credits: 3
- SWE 642 - Software Engineering for the World Wide Web Credits: 3
- SWE 645 - Component-Based Software Development Credits: 3
- SWE 720 - Advanced Software Requirements Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 727 - Quality of Service for Software Architectures Credits: 3

Computer Forensics (CFRS)

- CFRS 761 - Malware Reverse Engineering Credits: 3
Information Systems, MS

Banner Code: VS-MS-ISYS

School: Volgenau School of Engineering

Department: Computer Science

This professional degree program focuses on the technical, managerial, and policy issues associated with designing, building, and maintaining information systems in organizations. Data, information, and knowledge are crucial to the modern enterprise, and the MS in information systems (MS-ISYS) addresses both the theoretical and engineering aspects of specifying, designing, implementing, and managing large-scale information systems.

The goals of the MS-ISYS are to provide a high-quality program that allows students with diverse baccalaureate and professional backgrounds to obtain the MS degree; provide a technical body of knowledge, together with hands-on project experience, that will allow students to analyze, design, build, deploy, maintain, and manage information systems in large organizations such as industry, government, and nonprofits; and provide a course of study that allows professionals to pursue a technical or a managerial approach to information systems.

The career paths open to graduates include technical and management positions. Technical positions include systems analyst, data administrator, information architect, database administrator, systems architect, decision analyst, data warehouse administrator, database programmer, web-based information systems designer and programmer, information engineer, and knowledge engineer. Management positions include chief information officer, chief knowledge officer, chief privacy officer, project manager, and webmaster.

Admission Requirements

Applicants must hold a four-year (120-credit) baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or better in the last 60 credits. They also must meet the following requirements:

- Show proof of a satisfactory score on the GMAT or GRE, if required. The applicable test should have been taken within five years of applying for admission. The department policy is that the GMAT or GRE is required unless the applicant has an undergraduate degree in science or engineering from a U.S. university and graduated with a GPA of 3.00 or better in the last 60 hours; a graduate degree in science or engineering from a U.S. university; or been admitted as a non-degree student and meets all the following requirements: an undergraduate degree from a U.S. university, an undergraduate GPA of 3.00 or better in the last 60 hours, and a B or better grade in all foundation courses taken at Mason or elsewhere.
- Submit the appropriate application forms with three letters of recommendation from people directly knowledgeable of the applicant’s professional and academic competence, a one-page goals statement, and a work résumé.
- Submit a department self-evaluation form that is essential for evaluating foundation requirements by the department faculty. This form may be obtained from the department office or the department web page.
International students must submit their TOEFL score.

**Foundation Requirements**

To ensure students have an adequate background in mathematical methods, computer technology, and programming knowledge, the program requires the following foundation courses or their equivalents: INFS 501 Discrete and Logical Structures for Information Systems, INFS 515 Computer Organization, INFS 519 Program Design and Data Structures, SWE 510 Object-Oriented Programming in Java.

Prospective students are asked to complete a department self-evaluation form indicating whether previously taken courses may satisfy these foundation requirements. On acceptance, students are advised of the necessary foundation courses to be satisfactorily completed to meet this requirement. Foundation courses do not earn credit toward the MS degree; however, they must be successfully completed with a grade of B or better before enrolling in the core curriculum.

Students may test out to indicate they have the requisite knowledge for those foundations of SWE 510, INFS 501, 515, and 519. The exams are given before classes begin in January and August, and can only be taken once. Registration is not required; students need only be present at the date, time, and location specified, and bring some form of photographic identification. Detailed information is available on the department web site. Students failing any of the exams must take the equivalent course before enrolling in the core curriculum courses.

**Advising**

The department holds orientation meetings in January and August to advise newly admitted and continuing students. Members of the faculty are present to answer questions and offer advice concerning programs of study. Detailed information is available on the department web site.

The department also provides an advising function to students, as outlined in the student advising form available from the department. Each student is assigned a faculty advisor with whom to confer on matters related to degree requirements. A plan of study form for the MS degree should be completed and submitted by the student soon after admission to the program. This plan serves as a guide for the student.

**Degree Requirements**

Completion of the MS program requires a minimum of 30 approved graduate credits (10 courses). To provide a common background in the fundamentals of information systems, the following four courses are required of all students:

- **INFS 612 - Principles and Practices of Communication Networks** Credits: 3
- **INFS 614 - Database Management** Credits: 3
- **INFS 622 - Information Systems Analysis and Design** Credits: 3
- **ISA 562 - Information Security Theory and Practice** Credits: 3

**Notes:**

For students taking the emphasis area and/or graduate certificate in software engineering, SWE 620 must be substituted for INFS 622.

The core courses constitute the technical body of knowledge for the program. The elective courses are organized into the following emphasis areas: database management, data mining, electronic commerce, software engineering, knowledge management, and information security and assurance.
Elective Courses

In addition to the core courses taken as part of the MS-ISYS curriculum, students may choose an emphasis within the program by taking six courses from one of the emphasis areas listed below. Students may also choose electives spanning several emphasis areas; they may also plan their electives so as to obtain certificates offered by the department. A list of approved electives is given within emphasis areas and by graduate program. A full list is provided at the end of this section. Special courses may be used as electives with prior approval of the student’s academic advisor and the graduate coordinator.

Students, with the consent of a faculty sponsor and faculty advisor, may also elect courses in individualized study, special topics, or a 6-credit thesis, which is primarily intended for students planning to pursue a PhD in information technology with a concentration in information systems.

Listed below are the emphasis areas and the approved elective courses in each area.

Database Management

- CS 787 - Decision Guidance Systems Credits: 3
- INFS 623 - Web Search Engines and Recommender Systems Credits: 3
- INFS 740 - Database Programming for the World Wide Web Credits: 3
- INFS 760 - Advanced Database Management Credits: 3
- INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
- INFS 796 - Directed Readings in Information Technology Credits: 3
- ISA 765 - Database and Distributed Systems Security Credits: 3

Data Mining

- CS 757 - Mining Massive Datasets Credits: 3
- CS 780 - Data Mining on Multimedia Data Credits: 3
- CS 782 - Machine Learning Credits: 3
- INFS 755 - Data Mining Credits: 3
- INFS 623 - Web Search Engines and Recommender Systems Credits: 3
- INFS 796 - Directed Readings in Information Technology Credits: 3

Electronic Commerce

- INFS 640 - Introduction to Electronic Commerce Credits: 3
- INFS 770 - Knowledge Management for E-Business Credits: 3
- INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
- INFS 774 - Enterprise Architecture Credits: 3
- INFS 790 - Information Systems Policy and Administration Credits: 3
- INFS 796 - Directed Readings in Information Technology Credits: 3
- ISA 656 - Network Security Credits: 3
- ISA 767 - Secure Electronic Commerce Credits: 3

Software Engineering
• SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
• SWE 621 - Software Modeling and Architectural Design Credits: 3
• SWE 622 - Distributed Software Engineering Credits: 3
• SWE 625 - Software Project Management Credits: 3
• SWE 632 - User Interface Design and Development Credits: 3
• SWE 637 - Software Testing Credits: 3
• SWE 642 - Software Engineering for the World Wide Web Credits: 3
• SWE 721 - Reusable Software Architectures Credits: 3
• SWE 727 - Quality of Service for Software Architectures Credits: 3
• SWE 795 - Advanced Topics in Software Engineering Credits: 3

Knowledge Management

• CS 580 - Introduction to Artificial Intelligence Credits: 3
• CS 681 - Designing Expert Systems Credits: 3
• CS 785 - Knowledge Acquisition and Problem Solving Credits: 3
• INFS 623 - Web Search Engines and Recommender Systems Credits: 3
• INFS 650 - Development Frameworks for Information Systems Applications Credits: 3
• INFS 740 - Database Programming for the World Wide Web Credits: 3
• INFS 755 - Data Mining Credits: 3
• INFS 770 - Knowledge Management for E-Business Credits: 3
• INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
• INFS 774 - Enterprise Architecture Credits: 3
• INFS 790 - Information Systems Policy and Administration Credits: 3
• INFS 796 - Directed Readings in Information Technology Credits: 3

Information Security and Assurance

• ISA 563 - Fundamentals of Systems Programming Credits: 3
• ISA 640 - Programming Language Security Credits: 3
• ISA 652 - Security Audit and Compliance Testing Credits: 3
• ISA 656 - Network Security Credits: 3
• ISA 673 - Operating Systems Security Credits: 3
• ISA 674 - Intrusion Detection Credits: 3
• ISA 681 - Secure Software Design Credits: 3
• ISA 763 - Security Protocol Analysis Credits: 3
• ISA 764 - Security Experimentation Credits: 3
• ISA 765 - Database and Distributed Systems Security Credits: 3
• ISA 767 - Secure Electronic Commerce Credits: 3
• ISA 785 - Research in Digital Forensics Credits: 3
• ISA 796 - Directed Readings in Information Security Credits: 3

Certificates
Certificates may also be obtained in the following areas: database management, data mining, electronic commerce, information engineering, information security and assurance, intelligent agents, software architecture, software engineering, foundations of information systems, web-based software engineering, biometrics, computer games technology, and computer networking. These certificates are described in the computer science certificates section of this catalog.

Approved Electives

A full list of approved electives is given below by program:

Information Systems (INFS)

- INFS 623 - Web Search Engines and Recommender Systems Credits: 3
- INFS 640 - Introduction to Electronic Commerce Credits: 3
- INFS 650 - Development Frameworks for Information Systems Applications Credits: 3
- INFS 697 - Topics in Information Systems Credits: 1-6
- INFS 740 - Database Programming for the World Wide Web Credits: 3
- INFS 755 - Data Mining Credits: 3
- INFS 760 - Advanced Database Management Credits: 3
- INFS 770 - Knowledge Management for E-Business Credits: 3
- INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
- INFS 774 - Enterprise Architecture Credits: 3
- INFS 790 - Information Systems Policy and Administration Credits: 3
- INFS 796 - Directed Readings in Information Technology Credits: 3
- INFS 797 - Advanced Topics in Information Systems Credits: 1-6

Information Security and Assurance (ISA)

- ISA 563 - Fundamentals of Systems Programming Credits: 3
- ISA 564 - Security Laboratory Credits: 3
- ISA 640 - Programming Language Security Credits: 3
- ISA 650 - Security Policy Credits: 3
- ISA 652 - Security Audit and Compliance Testing Credits: 3
- ISA 656 - Network Security Credits: 3
- ISA 673 - Operating Systems Security Credits: 3
- ISA 674 - Intrusion Detection Credits: 3
- ISA 681 - Secure Software Design Credits: 3
- ISA 697 - Topics in Information Security Credits: 1-6
- ISA 763 - Security Protocol Analysis Credits: 3
- ISA 764 - Security Experimentation Credits: 3
- ISA 765 - Database and Distributed Systems Security Credits: 3
- ISA 767 - Secure Electronic Commerce Credits: 3
- ISA 785 - Research in Digital Forensics Credits: 3
- ISA 797 - Advanced Topics in Information Security Credits: 3

Software Engineering (SWE)
SWE 620 - Software Requirements Analysis and Specification Credits: 3
SWE 623 - Formal Methods and Models in Software Engineering Credits: 3
SWE 625 - Software Project Management Credits: 3
SWE 626 - Software Project Laboratory Credits: 3
SWE 630 - Software Engineering Economics Credits: 3
SWE 631 - Object-Oriented Design Patterns Credits: 3
SWE 632 - User Interface Design and Development Credits: 3
SWE 641 - Systems Architecture for Large-Scale Systems Credits: 3
SWE 642 - Software Engineering for the World Wide Web Credits: 3
SWE 645 - Component-Based Software Development Credits: 3
SWE 699 - Special Topics in Software Engineering Credits: 3
SWE 720 - Advanced Software Requirements Credits: 3
SWE 721 - Reusable Software Architectures Credits: 3
SWE 723 - Precise Modeling Credits: 3
SWE 727 - Quality of Service for Software Architectures Credits: 3
SWE 763 - Software Engineering Experimentation Credits: 3
SWE 781 - Secure Software Design and Programming Credits: 3
SWE 795 - Advanced Topics in Software Engineering Credits: 3
SWE 796 - Directed Readings in Software Engineering Credits: 3
SWE 798 - Research Project Credits: 3

Computer Science (CS)

CS 540 - Language Processors Credits: 3
CS 580 - Introduction to Artificial Intelligence Credits: 3
CS 583 - Analysis of Algorithms Credits: 3
CS 631 - Object-Oriented Design Patterns Credits: 3
CS 635 - Foundations of Parallel Computation Credits: 3
CS 640 - Advanced Compilers Credits: 3
CS 650 - Advanced Database Management Credits: 3
CS 662 - Computer Graphics Game Technologies Credits: 3
CS 671 - Advanced Operating Systems Credits: 3
CS 672 - Computer System Performance Evaluation Credits: 3
CS 673 - Multimedia Computing and Systems Credits: 3
CS 680 - Natural Language Processing Credits: 3
CS 681 - Designing Expert Systems Credits: 3
CS 682 - Computer Vision Credits: 3
CS 683 - Parallel Algorithms Credits: 3
CS 684 - Graph Algorithms Credits: 3
CS 685 - Intelligent Systems for Robots Credits: 3
CS 686 - Image Processing and Applications Credits: 3
CS 687 - Advanced Artificial Intelligence Credits: 3
CS 688 - Pattern Recognition Credits: 3
CS 700 - Quantitative Methods and Experimental Design in Computer Science Credits: 3
CS 706 - Concurrent Software Systems Credits: 3
CS 735 - Concurrency Credits: 3
• CS 752 - Interactive Graphics Software Credits: 3
• CS 755 - Advanced Computer Networks Credits: 3
• CS 756 - Performance Analysis of Computer Networks Credits: 3
• CS 757 - Mining Massive Datasets Credits: 3
• CS 773 - Real-Time Systems Design and Development Credits: 3
• CS 777 - Human-Computer Intelligent Interaction Credits: 3
• CS 779 - Topics in Resilient and Secure Computer Systems Credits: 3
• CS 780 - Data Mining on Multimedia Data Credits: 3
• CS 782 - Machine Learning Credits: 3
• CS 785 - Knowledge Acquisition and Problem Solving Credits: 3
• CS 795 - Advanced Topics in CS Credits: 3

Electrical and Computer Engineering (ECE)

• ECE 511 - Microprocessors Credits: 3
• ECE 521 - Modern Systems Theory Credits: 3
• ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
• ECE 535 - Digital Signal Processing Credits: 3
• ECE 545 - Digital System Design with VHDL Credits: 3
• ECE 548 - Sequential Machine Theory Credits: 3
• ECE 549 - Theory and Applications of Artificial Neural Networks Credits: 3
• ECE 584 - Semiconductor Device Fundamentals Credits: 3
• ECE 586 - Digital Integrated Circuits Credits: 3
• ECE 611 - Advanced Microprocessors Credits: 3
• ECE 612 - Real-Time Embedded Systems Credits: 3
• ECE 620 - Optimal Control Theory Credits: 3
• ECE 621 - Systems Identification Credits: 3
• ECE 624 - Control Systems Credits: 3
• ECE 630 - Statistical Communication Theory Credits: 3
• ECE 633 - Coding Theory Credits: 3
• ECE 635 - Adaptive Signal Processing Credits: 3
• ECE 638 - Fast Algorithms and Architectures for Digital Signal Processing Credits: 3
• ECE 641 - Computer System Architecture Credits: 3
• ECE 642 - Design and Analysis of Computer Communication Networks Credits: 3
• ECE 643 - Network Switching and Routing Credits: 3
• ECE 644 - Architectures and Algorithms for Image Processing Credits: 3
• ECE 645 - Computer Arithmetic Credits: 3
• ECE 646 - Cryptography and Computer Network Security Credits: 3
• ECE 650 - Robotics Credits: 3
• ECE 680 - Physical VLSI Design Credits: 3
• ECE 681 - VLSI Design for ASICs Credits: 3
• ECE 732 - Mobile Communication Systems Credits: 3
• ECE 734 - Detection and Estimation Theory Credits: 3
• ECE 741 - Wireless Networks Credits: 3
• ECE 744 - Computer Vision and Expert Systems Credits: 3
• ECE 746 - Advanced Applied Cryptography Credits: 3
• ECE 749 - Neural Networks for Control Credits: 3

Operations Research (OR)

• OR 540 - Management Science Credits: 3  
• OR 541 - Operations Research: Deterministic Models Credits: 3  
• OR 542 - Operations Research: Stochastic Models Credits: 3  
• OR 635 - Discrete System Simulation Credits: 3  
• OR 640 - Global Optimization and Computational Intelligence Credits: 3  
• OR 641 - Linear Programming Credits: 3  
• OR 642 - Integer Programming Credits: 3  
• OR 643 - Network Modeling Credits: 3  
• OR 644 - Nonlinear Programming Credits: 3  
• OR 645 - Stochastic Processes Credits: 3  
• OR 647 - Queuing Theory Credits: 3  
• OR 681 - Decision and Risk Analysis Credits: 3  
• OR 690 - Optimization of Supply Chains Credits: 3  

Psychology (PSYC)

• PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3  
• PSYC 737 - Psychology of Human-Technology Interaction Credits: 3  

Statistics (STAT)

• STAT 544 - Applied Probability Credits: 3  
• STAT 554 - Applied Statistics Credits: 3  
• STAT 652 - Statistical Inference Credits: 3  
• STAT 655 - Analysis of Variance Credits: 3  
• STAT 656 - Regression Analysis Credits: 3  
• STAT 662 - Multivariate Statistical Methods Credits: 3  
• STAT 663 - Statistical Graphics and Data Exploration I Credits: 3  
• STAT 664 - Bayesian Inference and Decision Theory Credits: 3  
• STAT 674 - Survey Sampling II Credits: 3  

Systems Engineering (SYST)

• SYST 520 - System Engineering Design Credits: 3  
• SYST 530 - System Management and Evaluation Credits: 3  
• SYST 542 - Decision Support Systems Engineering Credits: 3  
• SYST 560 - Introduction to Air Traffic Control Credits: 3  
• SYST 573 - Decision and Risk Analysis Credits: 3  
• SYST 611 - System Methodology and Modeling Credits: 3  
• SYST 620 - Discrete Event Systems Credits: 3
Total: 30 credits

Software Engineering, MS

Banner Code: VS-MS-SWE

School: Volgenau School of Engineering

Department: Computer Science

This program provides specialized knowledge and experience in developing and modifying large, complex software systems. It emphasizes technical and management aspects of software engineering development. Software engineering is an established discipline based on requirements analysis, design, construction, testing, maintenance, economics, and management issues. A pragmatic approach to problem solving is the hallmark of a software engineer. Software engineers are concerned with the theoretical and practical aspects of technology, cost, and social impact of software systems that are effective and efficient.

Software engineers are in demand in every segment of society affected by computing technology. Potential employers include all software vendors and Internet-based companies, electronic business organizations, businesses that build and sell computers, research and development laboratories, aerospace companies, government contractors, banks, insurance companies, and manufacturing organizations. The master’s program is concerned with technical and managerial issues, but primary emphasis is placed on the technical aspects of building and modifying high-quality software systems.

Successful applicants have a broad variety of undergraduate backgrounds, including computer science, science and mathematics, engineering, liberal arts, and business. Many students are working or have worked in the software industry.

The program is revised on a regular basis to stay abreast of the latest developments in information technology (IT). The program introduced a major revision for fall 2005; recent additions include software construction with the object-oriented Java programming language, requirements analysis with use cases and the Unified Modeling Language (UML), object-oriented software design with the UML, graphical user interface design, software engineering for the web, software project management using the spiral life cycle model and the Capability Maturity Model, software architecture, design patterns, system testing and testing of object-oriented components, and formal methods using the Object Constraint Language. All classes are scheduled in the late afternoon and early evening to accommodate employed students.

Foundation Requirements

Students entering the MS program must have course work or equivalent knowledge in the following areas: introductory programming in any language; knowledge of an object-oriented programming language such as Java, C++, or C#; data structures and algorithms; machine organization (such as those given in computer system architecture or assembly language courses); and topics in discrete mathematics, including sets, relations, functions, trees, graphs, and inductive proofs.
The level of knowledge required in these areas is equivalent to that taught in undergraduate courses and may be achieved by taking the following foundation courses from Mason: INFS 501 Discrete and Logical Structures for Information Systems, SWE 510 Object-Oriented Programming in Java, INFS 515 Computer Organization, and INFS 519 Program Design and Data Structures.

In addition, it is desirable, though not required, that entering students have at least one year of work experience in building or modifying software systems.

Prospective students are asked to complete a department self-evaluation form, indicating whether previously taken courses may satisfy these foundation requirements. On acceptance, students are advised of the necessary foundation courses to be satisfactorily completed to meet this requirement. Foundation courses do not earn credit toward the MS degree; however, they must be successfully completed with a grade of B or better before enrolling in the core curriculum.

Students may test out to indicate they have the requisite knowledge for those foundation courses. The exams are given before classes begin in January and August, and can only be taken once. Registration is not required; students need only be present at the date, time, and location specified and bring some form of photographic identification. Detailed information is available on the department web site. Students failing any one of the exams must take the equivalent course before enrolling in the core curriculum courses.

**Admission Requirements**

In addition to general admission requirements of the university, each applicant to the MS program must hold a four-year (120-credit) baccalaureate degree in an appropriate discipline from an accredited institution and have earned a GPA of 3.00 or better in the last 60 credits of undergraduate study. Other requirements are as follows:

- Provide a one- to two-page statement of educational and work experience in the computing field that includes a statement of career goals in software engineering.
- Submit a department self-evaluation form, which can be obtained from the department. This form provides summary information concerning background and preparation for the program.
- Show proof of a satisfactory score on the GRE, if required. The test should have been taken within five years of applying for admission. The department policy is that the GRE is required unless the applicant has an undergraduate degree in science or engineering from a U.S. university and graduated with a GPA of 3.00 or better in the last 60 hours; a graduate degree in science or engineering from a U.S. university; or been admitted as a non-degree student and meets all the following requirements: an undergraduate degree from a U.S. university, an undergraduate GPA of 3.00 or better in the last 60 hours, and a B in all foundation courses taken at Mason or elsewhere.
- Submit the appropriate application form with three letters of recommendation from people directly knowledgeable of the applicant’s professional and academic competence.

Acceptance into the MS program is based on an overall assessment of the applicant’s ability to complete the program of study satisfactorily. Well-qualified students with minor deficiencies may be admitted to the program in provisional status, with specified course work to be completed within a specified time.

**Advising**

The department holds orientation meetings each January and August to advise incoming and continuing students. Members of the faculty are present to answer questions and offer advice concerning programs of study. Detailed information is available on the department web site.

The department also provides an advising function to students, as outlined in the student advising form available from the department. Each student is assigned a faculty advisor with whom to confer on matters related to degree requirements. A plan of study form for the MS degree should be completed and submitted by the student soon after admission; this plan serves as a guide for the student.
Degree Requirements

In addition to the general requirements of the university, the MS in software engineering requires a minimum of 30 graduate credits. The course work is divided into three categories: a breadth requirement of 12 credits of core courses, a depth requirement of 9 credits of emphasis courses, and 9 credits of elective courses.

Four Core Courses (12 credits)

- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3
- SWE 622 - Distributed Software Engineering Credits: 3
- SWE 637 - Software Testing Credits: 3

Emphasis Courses (9 credits)

Students may choose an emphasis by taking three courses from one of the emphasis areas of software design, secure software engineering, software management, and web applications design and development. With permission from the advisor, a student may choose to not take an emphasis. The emphasis area courses are:

Software Design

- SWE 626 - Software Project Laboratory Credits: 3
- SWE 632 - User Interface Design and Development Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 722 - Service Oriented Architecture Credits: 3
- SWE 727 - Quality of Service for Software Architectures Credits: 3
- SWE 781 - Secure Software Design and Programming Credits: 3

Secure Software Engineering

- ISA 562 - Information Security Theory and Practice Credits: 3
- SWE 642 - Software Engineering for the World Wide Web Credits: 3
- SWE 781 - Secure Software Design and Programming Credits: 3
- ISA 673 - Operating Systems Security Credits: 3

Software Management

- OR 540 - Management Science Credits: 3
- SWE 620 - Software Requirements Analysis and Specification Credits: 3
- SWE 625 - Software Project Management Credits: 3
- SWE 626 - Software Project Laboratory Credits: 3
- ISA 650 - Security Policy Credits: 3

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- INFS 614 - Database Management Credits: 3
- SWE 632 - User Interface Design and Development Credits: 3
- SWE 642 - Software Engineering for the World Wide Web Credits: 3
- SWE 645 - Component-Based Software Development Credits: 3
- SWE 722 - Service Oriented Architecture Credits: 3

Elective Courses (9 credits)

Students may select the remaining courses from the list of approved elective courses, including other emphasis areas and courses from other MS programs in the department and the Volgenau School. Students may choose other graduate electives with the consent of their faculty advisor and the graduate coordinator.

Students, with the consent of a faculty sponsor and faculty advisor, may also elect courses in individualized study, special topics, or a 6-credit thesis, which is primarily intended for students planning to pursue a PhD in information technology with a concentration in software engineering. The course designations are:

- SWE 699 - Special Topics in Software Engineering Credits: 3
- SWE 795 - Advanced Topics in Software Engineering Credits: 3
- SWE 796 - Directed Readings in Software Engineering Credits: 3
- SWE 798 - Research Project Credits: 3
- SWE 799 - Thesis Credits: 1-6

Approved Electives

Below is the list of approved electives organized by academic program. Students should note that a maximum of two 500-level courses are allowed as electives. Courses not on this list may only be taken with explicit signed permission from the MS-SWE advisor.

Information Systems (INFS)

- INFS 612 - Principles and Practices of Communication Networks Credits: 3
- INFS 614 - Database Management Credits: 3
- INFS 623 - Web Search Engines and Recommender Systems Credits: 3
- INFS 640 - Introduction to Electronic Commerce Credits: 3
- INFS 697 - Topics in Information Systems Credits: 1-6
- INFS 740 - Database Programming for the World Wide Web Credits: 3
- INFS 755 - Data Mining Credits: 3
- INFS 760 - Advanced Database Management Credits: 3
- INFS 770 - Knowledge Management for E-Business Credits: 3
- INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
- INFS 774 - Enterprise Architecture Credits: 3
• INFS 790 - Information Systems Policy and Administration Credits: 3
• INFS 797 - Advanced Topics in Information Systems Credits: 1-6

Information Security and Assurance (ISA)

• ISA 562 - Information Security Theory and Practice Credits: 3
• ISA 563 - Fundamentals of Systems Programming Credits: 3
• ISA 564 - Security Laboratory Credits: 3
• ISA 640 - Programming Language Security Credits: 3
• ISA 650 - Security Policy Credits: 3
• ISA 652 - Security Audit and Compliance Testing Credits: 3
• ISA 656 - Network Security Credits: 3
• ISA 673 - Operating Systems Security Credits: 3
• ISA 681 - Secure Software Design Credits: 3
• ISA 697 - Topics in Information Security Credits: 1-6
• ISA 763 - Security Protocol Analysis Credits: 3
• ISA 764 - Security Experimentation Credits: 3
• ISA 765 - Database and Distributed Systems Security Credits: 3
• ISA 767 - Secure Electronic Commerce Credits: 3
• ISA 785 - Research in Digital Forensics Credits: 3
• ISA 797 - Advanced Topics in Information Security Credits: 3

Software Engineering (SWE)

• SWE 620 - Software Requirements Analysis and Specification Credits: 3
• SWE 623 - Formal Methods and Models in Software Engineering Credits: 3
• SWE 625 - Software Project Management Credits: 3
• SWE 626 - Software Project Laboratory Credits: 3
• SWE 630 - Software Engineering Economics Credits: 3
• SWE 631 - Object-Oriented Design Patterns Credits: 3
• SWE 632 - User Interface Design and Development Credits: 3
• SWE 641 - Systems Architecture for Large-Scale Systems Credits: 3
• SWE 642 - Software Engineering for the World Wide Web Credits: 3
• SWE 645 - Component-Based Software Development Credits: 3
• SWE 699 - Special Topics in Software Engineering Credits: 3
• SWE 720 - Advanced Software Requirements Credits: 3
• SWE 721 - Reusable Software Architectures Credits: 3
• SWE 723 - Precise Modeling Credits: 3
• SWE 727 - Quality of Service for Software Architectures Credits: 3
• SWE 763 - Software Engineering Experimentation Credits: 3
• SWE 781 - Secure Software Design and Programming Credits: 3
• SWE 795 - Advanced Topics in Software Engineering Credits: 3
• SWE 796 - Directed Readings in Software Engineering Credits: 3
• SWE 798 - Research Project Credits: 3
• SWE 799 - Thesis Credits: 1-6
Computer Science (CS)

- CS 540 - Language Processors Credits: 3
- CS 555 - Computer Communications and Networking Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 580 - Introduction to Artificial Intelligence Credits: 3
- CS 583 - Analysis of Algorithms Credits: 3
- CS 611 - Computational Methods for Genomics Credits: 3
- CS 630 - Advanced Algorithms Credits: 3
- CS 635 - Foundations of Parallel Computation Credits: 3
- CS 640 - Advanced Compilers Credits: 3
- CS 650 - Advanced Database Management Credits: 3
- CS 662 - Computer Graphics Game Technologies Credits: 3
- CS 671 - Advanced Operating Systems Credits: 3
- CS 672 - Computer System Performance Evaluation Credits: 3
- CS 673 - Multimedia Computing and Systems Credits: 3
- CS 680 - Natural Language Processing Credits: 3
- CS 681 - Designing Expert Systems Credits: 3
- CS 682 - Computer Vision Credits: 3
- CS 683 - Parallel Algorithms Credits: 3
- CS 684 - Graph Algorithms Credits: 3
- CS 685 - Intelligent Systems for Robots Credits: 3
- CS 686 - Image Processing and Applications Credits: 3
- CS 687 - Advanced Artificial Intelligence Credits: 3
- CS 688 - Pattern Recognition Credits: 3
- CS 689 - Planning Motions of Robots and Molecules Credits: 3
- CS 700 - Quantitative Methods and Experimental Design in Computer Science Credits: 3
- CS 706 - Concurrent Software Systems Credits: 3
- CS 735 - Concurrency Credits: 3
- CS 752 - Interactive Graphics Software Credits: 3
- CS 755 - Advanced Computer Networks Credits: 3
- CS 756 - Performance Analysis of Computer Networks Credits: 3
- CS 757 - Mining Massive Datasets Credits: 3
- CS 773 - Real-Time Systems Design and Development Credits: 3
- CS 777 - Human-Computer Intelligent Interaction Credits: 3
- CS 779 - Topics in Resilient and Secure Computer Systems Credits: 3
- CS 780 - Data Mining on Multimedia Data Credits: 3
- CS 782 - Machine Learning Credits: 3
- CS 785 - Knowledge Acquisition and Problem Solving Credits: 3
- CS 787 - Decision Guidance Systems Credits: 3
- CS 795 - Advanced Topics in CS Credits: 3

Electrical and Computer Engineering (ECE)

- ECE 511 - Microprocessors Credits: 3
• ECE 521 - Modern Systems Theory Credits: 3
• ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
• ECE 535 - Digital Signal Processing Credits: 3
• ECE 537 - Introduction to Digital Image Processing (DIP) Credits: 3
• ECE 542 - Computer Network Architectures and Protocols Credits: 3
• ECE 545 - Digital System Design with VHDL Credits: 3
• ECE 548 - Sequential Machine Theory Credits: 3
• ECE 549 - Theory and Applications of Artificial Neural Networks Credits: 3
• ECE 584 - Semiconductor Device Fundamentals Credits: 3
• ECE 586 - Digital Integrated Circuits Credits: 3
• ECE 611 - Advanced Microprocessors Credits: 3
• ECE 612 - Real-Time Embedded Systems Credits: 3
• ECE 620 - Optimal Control Theory Credits: 3
• ECE 621 - Systems Identification Credits: 3
• ECE 624 - Control Systems Credits: 3
• ECE 630 - Statistical Communication Theory Credits: 3
• ECE 633 - Coding Theory Credits: 3
• ECE 635 - Adaptive Signal Processing Credits: 3
• ECE 638 - Fast Algorithms and Architectures for Digital Signal Processing Credits: 3
• ECE 641 - Computer System Architecture Credits: 3
• ECE 642 - Design and Analysis of Computer Communication Networks Credits: 3
• ECE 643 - Network Switching and Routing Credits: 3
• ECE 644 - Architectures and Algorithms for Image Processing Credits: 3
• ECE 645 - Computer Arithmetic Credits: 3
• ECE 646 - Cryptography and Computer Network Security Credits: 3
• ECE 650 - Robotics Credits: 3
• ECE 680 - Physical VLSI Design Credits: 3
• ECE 681 - VLSI Design for ASICs Credits: 3
• ECE 732 - Mobile Communication Systems Credits: 3
• ECE 741 - Wireless Networks Credits: 3
• ECE 744 - Computer Vision and Expert Systems Credits: 3
• ECE 746 - Advanced Applied Cryptography Credits: 3
• ECE 749 - Neural Networks for Control Credits: 3

Operations Research (OR)

• OR 540 - Management Science Credits: 3
• OR 541 - Operations Research: Deterministic Models Credits: 3
• OR 542 - Operations Research: Stochastic Models Credits: 3
• OR 635 - Discrete System Simulation Credits: 3
• OR 640 - Global Optimization and Computational Intelligence Credits: 3
• OR 641 - Linear Programming Credits: 3
• OR 642 - Integer Programming Credits: 3
• OR 643 - Network Modeling Credits: 3
• OR 644 - Nonlinear Programming Credits: 3
• OR 645 - Stochastic Processes Credits: 3
• OR 647 - Queuing Theory Credits: 3
• OR 681 - Decision and Risk Analysis Credits: 3
• OR 690 - Optimization of Supply Chains Credits: 3

Psychology (PSYC)

• PSYC 734 - Seminar in Human Factors and Applied Cognition Credits: 3
• PSYC 737 - Psychology of Human-Technology Interaction Credits: 3

Statistics (STAT)

• STAT 544 - Applied Probability Credits: 3
• STAT 554 - Applied Statistics Credits: 3
• STAT 652 - Statistical Inference Credits: 3
• STAT 655 - Analysis of Variance Credits: 3
• STAT 656 - Regression Analysis Credits: 3
• STAT 662 - Multivariate Statistical Methods Credits: 3
• STAT 663 - Statistical Graphics and Data Exploration I Credits: 3
• STAT 664 - Bayesian Inference and Decision Theory Credits: 3
• STAT 674 - Survey Sampling II Credits: 3

Systems Engineering (SYST)

• SYST 520 - System Engineering Design Credits: 3
• SYST 530 - System Management and Evaluation Credits: 3
• SYST 542 - Decision Support Systems Engineering Credits: 3
• SYST 560 - Introduction to Air Traffic Control Credits: 3
• SYST 573 - Decision and Risk Analysis Credits: 3
• SYST 611 - System Methodology and Modeling Credits: 3
• SYST 620 - Discrete Event Systems Credits: 3
• SYST 659 - Topics in Systems Engineering Credits: 3
• SYST 660 - Air Transportation Systems Modeling Credits: 3
• SYST 671 - Judgment and Choice Processing and Decision Making Credits: 3
• SYST 680 - Principles of Command, Control, Communications, Computing, and Intelligence (C4I) Credits: 3
• SYST 683 - Modeling, Simulation, and Gaming Credits: 3
• SYST 684 - Sensor Data Fusion Credits: 3
• SYST 760 - Special Topics in Command, Control, Communications, Computing, and Intelligence Systems Engineering Credits: 3

Total: 30 credits

Master's Level Certificate
Computer Games Technology Graduate Certificate

Banner Code: VS-CERG-CGT

School: Volgenau School of Engineering

Department: Computer Science

Admission Requirements

The certificate program in computer games technology is open to all students who are eligible for entrance into the master's degree program in computer science or any scientific or engineering discipline at Mason. To obtain the certificate, candidates must complete the following courses for a total of at least 12 credits. Transfer credit may substitute for at most one of these courses, subject to department approval.

The graduate certificate may only be pursued on a part-time basis.

Certificate Requirements

Required courses (9 credits):

- CS 551 - Computer Graphics Credits: 3
- CS 658 - Networked Virtual Environments Credits: 3
- CS 662 - Computer Graphics Game Technologies Credits: 3

Plus one course from the following:

- AVT 616 - Advanced Art and Interactivity Credits: 5
- AVT 676 - Graduate Sound Art Credits: 4
- AVT 686 - Experimental 3D Animation Credits: 4
- AVT 688 - Hybrid Animation Credits: 4
- CS 633 - Computational Geometry Credits: 3
- CS 673 - Multimedia Computing and Systems Credits: 3
- CS 687 - Advanced Artificial Intelligence Credits: 3
- CS 752 - Interactive Graphics Software Credits: 3
- CS 706 - Concurrent Software Systems Credits: 3
- CS 777 - Human-Computer Intelligent Interaction Credits: 3

Total: 12 credits
Courses offered via distance learning:

- CS 551 - Computer Graphics Credits: 3
- CS 658 - Networked Virtual Environments Credits: 3
- CS 706 - Concurrent Software Systems Credits: 3

**Computer Networking Graduate Certificate**

**Banner Code: VS-CERG-CNET**

**School: Volgenau School of Engineering**

**Department: Computer Science**

When brought together to form computer networks, the technologies of computing and communications exhibit a synergy that is revolutionizing our world. In-depth knowledge of the new discipline of computer networking increasingly is in demand as a basis for design and deployment of new information systems ranging from aspects of the global Internet to distributed systems in a variety of application domains. The courses for this certificate have been selected to provide a solid basis for understanding the core software and communications technologies on which today’s networks are based and how they may be combined to create effective computer networks. Courses cover mainstream and leading edge technology considerations, ensuring that students are prepared to function at the professional level in this fast moving and technologically challenging field.

The graduate certificate may only be pursued on a part-time basis.

**Admission Requirements**

The certificate program is open to all students who are eligible for entrance into the master’s degree program in computer science or any scientific or engineering discipline at Mason.

**Certificate Requirements**

Students must complete four courses with an average grade of B or higher for a total of 12 credits of graduate study.

**Required courses (6 credits):**

- CS 555 - Computer Communications and Networking Credits: 3
- CS 571 - Operating Systems Credits: 3

**At least one of the following (3-6 credits):**

- CS 755 - Advanced Computer Networks Credits: 3
- CS 756 - Performance Analysis of Computer Networks Credits: 3

**Zero or one of the following electives (0 or 3 credits):**
The area of databases is considered by most experts to be a fundamental area of computer and information science, and this graduate certificate program provides comprehensive coverage that includes theoretical foundations, practical experience, and recent advances.

The graduate certificate may only be pursued on a part-time basis.

**Admission Requirements**

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or better in the last 60 credits. Applicants must complete a self-assessment form, which can be obtained from the Computer Science Department. The form provides information concerning background and preparation for the program.

Applicants must possess knowledge equivalent to that provided by the following courses: INFS 501 Discrete and Logical Structures for Information Systems, SWE 510 Object-Oriented Programming in Java, INFS 515 Computer Organization, and INFS 519 Program Design and Data Structures.

Students not enrolled in a graduate degree program at Mason should apply for the database management certificate program through the Volgenau School Graduate Admissions Office. Students enrolled in a graduate degree program at Mason should contact the department for admission to the certificate program. Admission to the certificate program does not guarantee admission to any MS program.

**Certificate Requirements**

Students must complete four courses with an average grade of B or higher for a total of 12 credits of graduate study.

**Required courses (6 credits):**

- INFS 614 - Database Management Credits: 3
- INFS 760 - Advanced Database Management Credits: 3
Two from the following courses (6 credits):

- INFS 623 - Web Search Engines and Recommender Systems Credits: 3
- INFS 740 - Database Programming for the World Wide Web Credits: 3
- INFS 755 - Data Mining Credits: 3
- INFS 764 - Object-Oriented Database Systems Credits: 3
- INFS 797 - Advanced Topics in Information Systems Credits: 1-6
- ISA 765 - Database and Distributed Systems Security Credits: 3
- INFS 861 - Distributed Database Management Systems Credits: 3
- CSI 710 - Scientific Databases Credits: 3

Total: 12 credits

E-Commerce Graduate Certificate

Banner Code: VS-CERG-ECOM

School: Volgenau School of Engineering

Department: Computer Science

The Internet is having a significant effect on the way people interact with each other, with government, and with business. This graduate certificate program is for people who are interested in the use of Internet-based technology by people, government, and industry. We are witnessing the emergence of e-tailing, e-government, e-business, and business-to-business applications that are transforming society. The influence of electronic commerce is also being felt across international boundaries where it affects the management and administration of international business. The goal of the certificate in electronic commerce is to study the concepts, tools, policies, and underlying technology that enable Internet-based applications.

The graduate certificate may only be pursued on a part-time basis.

Admission Requirements

Applicants must hold a BS degree with a 3.00 or higher in the last 60 credits. They also must possess knowledge equivalent to the following four Mason courses, which are considered foundation courses: INFS 501 Discrete and Logical Structures for Information Systems, INFS 515 Computer Organization, INFS 519 Program Design and Data Structures, and SWE 510 Object-Oriented Programming in Java. Applicants also must possess equivalent knowledge of INFS 612 and 614; SWE 619, 620, and 621; or the prerequisite courses required for the selected electives.

Applicants must submit a one- to two-page statement of educational and work experience in the computing field. Applicants also need to complete a self-assessment form. The form provides summary information concerning background and preparation for the program.

For those students not enrolled in a Mason graduate degree program, application for the certificate program is made through the Volgenau School Graduate Admissions Office. Students enrolled in a Mason graduate degree program should contact the
Certificate Requirements

Students must complete four courses with an average grade of B or higher for a total of 12 credits of graduate study.

Two courses (6 credits):

- INFS 640 - Introduction to Electronic Commerce Credits: 3
- INFS 770 - Knowledge Management for E-Business Credits: 3

Two additional courses (6 credits) from the following:

Electives have been organized into emphasis areas, but students may also mix and match elective courses subject to satisfying course prerequisites:

Information Security

- ISA 562 - Information Security Theory and Practice Credits: 3
- ISA 656 - Network Security Credits: 3
- ISA 767 - Secure Electronic Commerce Credits: 3

Database Management

- INFS 740 - Database Programming for the World Wide Web Credits: 3
- INFS 755 - Data Mining Credits: 3
- INFS 760 - Advanced Database Management Credits: 3
- INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
- INFS 774 - Enterprise Architecture Credits: 3

Internet Software Engineering

- SWE 632 - User Interface Design and Development Credits: 3
- SWE 642 - Software Engineering for the World Wide Web Credits: 3
- SWE 645 - Component-Based Software Development Credits: 3

Health Medical Information Systems

- HAP 678 - Introduction to the U.S. Health System Credits: 3
- HAP 706 - Integrated Health Systems Management Credits: 3
- HAP 709 - Health Care Databases Credits: 3
- HAP 740 - Management of Health Information Systems Credits: 3
Total: 12 credits

Foundations of Information Systems Graduate Certificate

Banner Code: VS-CERG-FIS

School: Volgenau School of Engineering

Department: Computer Science

This certificate program is designed primarily for students who earned an undergraduate degree in an area other than information systems and are interested in acquiring solid foundations to pursue further education and a career in information systems, software engineering, information security and assurance, or a related discipline.

The graduate certificate may be pursued on a part-time or full-time basis.

Admission Requirements

The admission requirements for the certificate in foundations of information systems is a four-year bachelor’s degree with a GPA of 3.00 or higher. Also, the admission to the MS in Information Systems Program allows automatic admission to the certificate program.

Certificate Requirements

Students must complete four courses with an average grade of B or higher for a total of 12 credits of graduate study.

Required courses (12 credits)

Take each one of the following foundation courses (no substitutions are allowed):

- INFS 501 - Discrete and Logical Structures for Information Systems Credits: 3
- INFS 515 - Computer Organization Credits: 3
- INFS 519 - Program Design and Data Structures Credits: 3
- SWE 510 - Object-Oriented Programming in Java Credits: 3

Total: 12 credits

Information Engineering Graduate Certificate

Banner Code: VS-CERG-INFE

School: Volgenau School of Engineering
Department: Computer Science

This graduate certificate program is tailored for people involved in the specification, design, implementation, and management of data- and knowledge-intensive information systems. The certificate program prepares students for research, development, and professional practice in information engineering by offering a hands-on set of courses providing theoretical knowledge and practical experience with methods and tools associated with database management systems, data modeling, knowledge acquisition, data and knowledge representation, and software engineering.

The graduate certificate may be pursued on a part-time or full-time basis.

Admission Requirements

Applicants must have a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or higher in the last 60 credits. In addition, applicants must complete a self-assessment form, which can be obtained from the Computer Science Department. This form provides summary information concerning background and preparation for the program.

Applicants must possess knowledge equivalent to that provided by the following courses: INFS 501 Discrete and Logical Structures for Information Systems, SWE 510 Object-Oriented Programming in Java, INFS 515 Computer Organization, and INFS 519 Program Design and Data Structures.

Students not enrolled in a Mason graduate degree program should apply for the information engineering certificate program through the Volgenau School Graduate Admissions Office. Students enrolled in a Mason graduate degree program should apply to the department for admission into the certificate program. Admission into the certificate program does not guarantee acceptance into any MS program.

Certificate Requirements

Students must complete four courses, with an average grade of B or better, for a total of 12 credits of graduate study. Note that students enrolled in the MS-ISYS program as well as this certificate should not take INFS 622.

To obtain the certificate, students must complete the following:

Four required courses (12 credits):

- INFS 612 - Principles and Practices of Communication Networks Credits: 3
- INFS 614 - Database Management Credits: 3
- SWE 620 - Software Requirements Analysis and Specification Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3

Total: 12 credits

Information Security and Assurance Graduate Certificate

Banner Code: VS-CERG-ISA

School: Volgenau School of Engineering
Department: Computer Science

This graduate certificate program is for people who are interested in science and methods for ensuring secrecy, integrity, availability, and legitimate use of information systems. The certificate may be pursued concurrently with any of the graduate programs in the Volgenau School.

The graduate certificate may only be pursued on a part-time basis.

Admission Requirements

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or higher in the last 60 credits. In addition, applicants must complete a self-assessment form, which can be obtained from the Computer Science Department. This form provides summary information concerning background and preparation for the program.

Applicants must possess knowledge equivalent to that provided by the following courses: INFS 501 Discrete and Logical Structures for Information Systems, SWE 510 Object-Oriented Programming in Java, INFS 515 Computer Organization, and INFS 519 Program Design and Data Structures.

Students must also possess the equivalent knowledge of CS 571 and CS 555, or the prerequisite courses required for the selected electives. Students not enrolled in a graduate degree program at Mason should apply for the certificate program through the Volgenau School Graduate Admissions Office. Students enrolled in a Mason graduate degree program should apply to the department for admission into the certificate program. Admission into the certificate program does not guarantee acceptance into any MS program.

Certificate Requirements

Students must complete four courses with an average grade of B or better for a total of 12 credits of graduate study.

Two required courses (6 credits):

- ISA 562 - Information Security Theory and Practice Credits: 3
- ISA 656 - Network Security Credits: 3

Two additional courses (6 credits):

Two electives to be taken from the following, excluding ISA 697, ISA 796, ISA 797, and ISA 798.

- Courses at the ISA 600 and 700 level
- ISA 564 - Security Laboratory Credits: 3

Total: 12 credits

Intelligent Agents Graduate Certificate

Banner Code: VS-CERG-INAG
School: Volgenau School of Engineering

Department: Computer Science

This certificate concentrates on the theory and practice of designing and developing systems that rely on knowledge and reasoning, generically called intelligent agents: expert systems, knowledge-based systems, knowledge-based decision support systems, expert database systems, intelligent tutoring systems, and so on. Capturing, using, preserving, transferring, and sharing knowledge is of critical importance to any organization as society evolves from an information society to a knowledge society. Therefore, the ability to design and develop intelligent agents for a wide variety of domains is becoming a highly valuable expertise. The courses in this certificate program cover the basics of knowledge engineering and intelligent agents, as well as advanced research topics. Basic topics include knowledge representation, knowledge acquisition, heuristic search, problem solving and planning, uncertainty reasoning, machine learning, natural language processing, design of expert systems, human computer interaction, data mining, knowledge discovery, and knowledge management. Advanced topics include the development of multiagent systems, mixed-initiative intelligent systems, web-based intelligent agents, and distributed ontologies.

The graduate certificate may only be pursued on a part-time basis.

Admission Requirements

The program is open to all students who are eligible for entrance into the master’s degree program in computer science or any scientific or engineering discipline at Mason.

Certificate Requirements

Students must complete the following courses for a total of 12 credits:

Required (3 credits):

- CS 580 - Introduction to Artificial Intelligence Credits: 3

Plus three of the following elective courses (9 credits):

- CS 659 - Theory and Applications of Data Mining Credits: 3
- CS 680 - Natural Language Processing Credits: 3
- CS 681 - Designing Expert Systems Credits: 3
- CS 685 - Intelligent Systems for Robots Credits: 3
- CS 687 - Advanced Artificial Intelligence Credits: 3
- CS 777 - Human-Computer Intelligent Interaction Credits: 3
- CS 780 - Data Mining on Multimedia Data Credits: 3
- CS 782 - Machine Learning Credits: 3
- CS 785 - Knowledge Acquisition and Problem Solving Credits: 3
- CS 798 - Project Seminar Credits: 3
- CS 811 - Research Topics in Machine Learning and Inference Credits: 3
- CS 880 - Research Topics in Artificial Intelligence Credits: 3
- INFS 772 - Intelligent Agents and the Semantic Web Credits: 3
Note:

One of the three courses may be taken from another MS or PhD program in the Volgenau School with advisor approval, provided it belongs to the certificate area.

Total: 12 credits

Software Architecture Graduate Certificate

Banner Code: VS-CERG-SWA

School: Volgenau School of Engineering

Department: Computer Science

This graduate certificate program provides knowledge, tools, and techniques to those who are working or planning to work in software architecture but do not want to complete the requirements for a master’s degree in the field. The certificate may be pursued concurrently with any of the graduate degree programs in the Volgenau School.

Software architecture is an essential part of a software system and can be considered the backbone for such a system. Many industrial organizations recognize the important role of software architecture and have requested specific courses and graduate certification in this area. This proposed graduate certificate program addresses this industrial need. Mason is well-positioned to address this need because the university already offers several relevant courses and has the faculty with the necessary expertise to teach them.

The graduate certificate may only be pursued on a part-time basis.

Admission Requirements

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or higher in the last 60 credits. In addition, applicants must complete a self-assessment form, which can be obtained from the department. This form provides summary information concerning background and preparation for the program.

Applicants must possess knowledge equivalent to the following undergraduate courses: structured programming in a modern programming language, data structures, discrete mathematics, and machine organization. The level of knowledge may also be achieved by taking the following foundation courses at Mason: INFS 501 Discrete and Logical Structures for Information Systems, SWE 510 Object-Oriented Programming in Java, INFS 515 Computer Organization, and INFS 519 Program Design and Data Structures. In addition, it is desirable, but not necessary, for applicants to have at least one year of appropriate work experience in building or modifying software systems.

Applicants must submit a one- to two-page statement of educational and work experience in the computing field that includes a statement of career goals in software engineering. Students not enrolled in a Mason graduate degree program should apply for the certificate program through the Volgenau School Graduate Admissions Office. Students enrolled in a Mason graduate degree program should apply to the Computer Science office for admission into the certificate program. Admission into the certificate program does not guarantee acceptance into any MS program.

Certificate Requirements
Students must complete four courses with an average grade of B or better for a total of 12 credits of graduate study.

Required courses (3 credits):

- SWE 621 - Software Modeling and Architectural Design Credits: 3

At least two of the following courses (6 or 9 credits):

- SWE 699 - Special Topics in Software Engineering Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 727 - Quality of Service for Software Architectures Credits: 3
- SWE 795 - Advanced Topics in Software Engineering Credits: 3

Zero or one from the following courses (0 or 3 credits) for a total of 12 credits:

- CS 672 - Computer System Performance Evaluation Credits: 3
- CS 673 - Multimedia Computing and Systems Credits: 3
- SWE 620 - Software Requirements Analysis and Specification Credits: 3
- SWE 622 - Distributed Software Engineering Credits: 3
- SWE 625 - Software Project Management Credits: 3
- SWE 631 - Object-Oriented Design Patterns Credits: 3
- SWE 637 - Software Testing Credits: 3
- SWE 641 - Systems Architecture for Large-Scale Systems Credits: 3
- SWE 645 - Component-Based Software Development Credits: 3
- SWE 781 - Secure Software Design and Programming Credits: 3
- SWE 823 - Software for Critical Systems Credits: 3

Total: 12 credits

Software Engineering for C4I Graduate Certificate

Banner Code: VS-CERG-SC4I

School: Volgenau School of Engineering

Department: Computer Science
This graduate certificate is aimed at students who wish to specialize in C4I but have a computer science or software engineering background, and wish to combine the certificate with a MS degree in Computer Science or Software Engineering.

The graduate certificate may be pursued on a part-time or full-time basis.

**Admissions Requirements**

Applicants must have a baccalaureate degree from an accredited institution, and have earned a GPA of 3.0 or higher in the last 60 credits. In addition, applicants must complete a self-assessment form, which can be obtained from the Computer Science Department. This form provides summary information concerning background and preparation for the program.

**Certificate Requirements**

Students must complete three required courses and one elective, with an average grade of B or better, for a total of 12 credits of graduate study.

**Required Courses (9 credits)**

- SYST 580 - Introduction to C4I Systems Credits: 3
- CS 555 - Computer Communications and Networking Credits: 3
- SWE 622 - Distributed Software Engineering Credits: 3

**Elective Course (subject to satisfying course prerequisites):**

- CS 658 - Networked Virtual Environments Credits: 3
- CS 755 - Advanced Computer Networks Credits: 3
- CS 756 - Performance Analysis of Computer Networks Credits: 3
- ISA 656 - Network Security Credits: 3
- ISA 674 - Intrusion Detection Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3
- SWE 625 - Software Project Management Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 727 - Quality of Service for Software Architectures Credits: 3

**Total: 12 credits**

**Software Engineering Graduate Certificate**

Banner Code: VS-CERG-SWE
This graduate certificate program provides knowledge, tools, and techniques to those who are working in or planning to work in software engineering but do not want to complete requirements for a master’s degree in the field. The certificate may be pursued concurrently with any of the graduate degree programs in the Volgenau School.

The graduate certificate may be pursued on a part-time or full-time basis.

**Admission Requirements**

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or higher in the last 60 credits. In addition, applicants must complete a self-assessment form, which can be obtained from the Computer Science Department. This form provides summary information concerning background and preparation for the program.

Applicants must possess knowledge equivalent to the following undergraduate courses: structured programming in a modern programming language, data structures, discrete mathematics, and machine organization. The level of knowledge may also be achieved by taking the following foundation courses at Mason: INFS 501 Discrete and Logical Structures for Information Systems, SWE 510 Object-Oriented Programming in Java, INFS 515 Computer Organization, and INFS 519 Program Design and Data Structures. In addition, it is desirable, but not necessary, for applicants to have at least one year of appropriate work experience in building or modifying software systems.

Applicants must submit a one- to two-page statement of educational and work experience in the computing field that includes a statement of career goals in software engineering. Students not enrolled in a Mason graduate degree program should apply for the certificate program through the Volgenau School Graduate Admissions Office. Students enrolled in a Mason graduate degree program should apply to the Computer Science Department for admission into the certificate program. Admission into the certificate program does not guarantee acceptance into any MS program.

**Certificate Requirements**

Students must complete four courses with an average grade of B or better for a total of 12 credits of graduate study.

**Three courses (9 credits) from the following:**

- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3
- SWE 622 - Distributed Software Engineering Credits: 3
- SWE 637 - Software Testing Credits: 3

**One additional course (3 credits) from the following:**

(subject to satisfying the prerequisites)

- CS 675 - Distributed Systems Credits: 3
- CS 706 - Concurrent Software Systems Credits: 3
- CS 735 - Concurrency Credits: 3
- SWE 620 - Software Requirements Analysis and Specification Credits: 3
- SWE 622 - Distributed Software Engineering Credits: 3
- SWE 623 - Formal Methods and Models in Software Engineering Credits: 3
- SWE 625 - Software Project Management Credits: 3
- SWE 626 - Software Project Laboratory Credits: 3
- SWE 630 - Software Engineering Economics Credits: 3
- SWE 631 - Object-Oriented Design Patterns Credits: 3
- SWE 632 - User Interface Design and Development Credits: 3
- SWE 637 - Software Testing Credits: 3
- SYST 621 - Systems Architecture Design Credits: 3
- SWE 642 - Software Engineering for the World Wide Web Credits: 3
- SWE 645 - Component-Based Software Development Credits: 3
- SWE 699 - Special Topics in Software Engineering Credits: 3
- SWE 720 - Advanced Software Requirements Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 723 - Precise Modeling Credits: 3
- SWE 727 - Quality of Service for Software Architectures Credits: 3
- SWE 763 - Software Engineering Experimentation Credits: 3
- SWE 781 - Secure Software Design and Programming Credits: 3
- SWE 795 - Advanced Topics in Software Engineering Credits: 3
- SWE 798 - Research Project Credits: 3

Notes:

Students enrolled in the MS in Information Systems Program must substitute SWE 620 for INFS 622 to obtain this certificate. Credit is not given for taking both INFS 622 and SWE 620; only 3 credits will be awarded.

Students enrolled in the MS in Computer Science Program may obtain a certificate in software engineering by taking any four SWE courses. If CS/SWE 706 is included, it is possible to complete the MS in computer science and the certificate in software engineering in 30 hours.

Total: 12 credits

Web-Based Software Engineering Graduate Certificate

Banner Code: VS-CERG-WBSE

School: Volgenau School of Engineering

Department: Computer Science

This graduate certificate program provides knowledge, tools, and techniques to those who are working in or planning to work in software engineering but do not want to complete requirements for a master’s degree in the field. The certificate may be pursued concurrently with any of the graduate degree programs in the Volgenau School.

The graduate certificate may be pursued on a part-time or full-time basis.
Admission Requirements

Applicants must hold a baccalaureate degree from an accredited institution and have earned a GPA of 3.00 or better in the last 60 credits. Applicants must complete a self-assessment form, which can be obtained from the department or the department website. The form provides information concerning background and preparation for the program.

Applicants must possess knowledge equivalent to that provided by the following courses: INFS 501 Discrete and Logical Structures for Information Systems, SWE 510 Object-Oriented Programming in Java, INFS 515 Computer Organization, and INFS 519 Program Design and Data Structures.

Students not enrolled in a Mason graduate degree program should apply to the certificate program through the Volgenau School Graduate Admissions Office. Students enrolled in a Mason graduate degree program should contact the department for admission to the certificate program. Admission to the certificate program does not guarantee admission to any MS program.

Certificate Requirements

Students must complete four courses with an average grade of B or higher for a total of 12 credits of graduate study.

Three required courses (9 credits):

- SWE 622 - Distributed Software Engineering Credits: 3
- SWE 632 - User Interface Design and Development Credits: 3
- SWE 642 - Software Engineering for the World Wide Web Credits: 3

One of the following courses (3 credits):

- CS 675 - Distributed Systems Credits: 3
- INFS 614 - Database Management Credits: 3
- ISA 656 - Network Security Credits: 3
- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- SWE 621 - Software Modeling and Architectural Design Credits: 3
- SWE 637 - Software Testing Credits: 3
- SWE 645 - Component-Based Software Development Credits: 3
- SWE 781 - Secure Software Design and Programming Credits: 3

Total: 12 credits

Doctoral Degree

Computer Science, PhD

Banner Code: VS-PHD-CS
The PhD program requires course work, qualifying and comprehensive examinations, and a doctoral dissertation that is first proposed and eventually defended. Mason’s general doctoral requirements apply to this program.

Admission Requirements

All applicants must have an undergraduate degree, and their prior academic work must show a strong academic background in computer science. In addition, they must have taken the GRE exams: the General Test is required from every applicant; the Subject Test in Computer Science is not required but is recommended. Finally, each applicant must provide a brief statement of career goals and personal aspirations, as well as three letters of reference. Each application receives careful consideration from the PhD Admission Committee.

Reduction of Credit

Students must complete a minimum of 72 graduate credits, which may be reduced by a maximum of 30 credits from an approved and completed master’s degree. Reduction of credit requires the approval of the program director or designee and the dean or designee of the school. They determine whether the credits are eligible for reduction of credit and applicable to the degree program and the number of credits to be reduced.

Degree Requirements

The 72 hours of required doctoral-level credits typically consist of 48 credits of regular coursework and 24 credits of dissertation research. The following degree plan is based on a student who receives a full 30 credit reduction. Students who do not receive a full credit reduction should choose additional credits in consultation with their advisor.

Doctoral Course Work (18 Credits)

- CS 600 - Theory of Computation Credits: 3 (must be completed with a grade of B+ or better)
- CS 700 - Quantitative Methods and Experimental Design in Computer Science Credits: 3
- CS 800 - Computer Science Colloquium Credits: 0 (must be enrolled in for two semesters)
- CS 990 - Dissertation Topic Presentation Credits: 0
- 12 credits in advanced graduate courses from a list maintained by the Computer Science Department and chosen in consultation with the student's advisor*.

*May include at most 3 credits of CS 896 Directed Reading and Research. Students may register in CS 896 only after passing the PhD qualifying exams.

Qualifying Exam

Students must demonstrate breadth of knowledge in computer science by passing written qualifying exams. The exams are offered once every semester (usually in the week before the semester begins). To qualify, each student must pass exams in four areas, one of which is foundations of computer science. The other three areas are chosen from these eight areas: operating systems, networks, compilers and languages, object-oriented software specification and construction, software modeling and architectural design, artificial intelligence, database systems, and information systems security. The four exams must be attempted in the same semester, and a failed exam may be retaken once only in the next semester. A student who fails to pass the
four exams in two consecutive semesters is subject to termination from the program. Each student must take a set of four exams no later than the first opportunity following the completion of 18 credits. If a student enters the program without a master’s degree in computer science or a related area, then the exams must be taken no later than the first opportunity following the completion of 30 credits.

Dissertation Research (24 credits)

Students may enroll in CS 998 only after passing the qualifying exams, and they may enroll in CS 999 only after advancing to candidacy. A minimum of 24 credits of CS 998 and CS 999 must be completed (only 24 credits of CS 998 and CS 999 may be applied toward the degree).

Select 24 credits from the following:

- CS 998 - Doctoral Dissertation Proposal Credits: 1-12
- CS 999 - Doctoral Dissertation Credits: 1-12 (must complete a minimum of 12 credits)

Dissertation Committee Selection

Each student must form a dissertation committee, comprising four or five individuals. Three members of the committee must be tenured or tenure-track faculty in the Computer Science Department. The fourth member must be from outside the department. The chair of the dissertation committee, who must also be the dissertation director, must be tenured or tenure-track faculty in the Volgenau School. The committee must be approved by the chair of the Computer Science Department.

Comprehensive Exam

Students must pass an oral comprehensive exam in which they demonstrate depth of knowledge in their intended area of research and ability to perform original research in that area. The scope of the oral exam is defined by a reading list prepared by the student and the dissertation director. The list should include research papers and textbooks that adequately cover the basic tools used in the research area, the fundamentals of the research area, and state-of-the-art knowledge in the specific focus of research. The reading list must be accompanied by a one-page description of the intended research. This document must be approved by the dissertation committee at least one month prior to the exam and becomes part of the student’s record. The duration of the oral exam is typically two hours. Students who fail the exam are allowed to retake it once. Failure in the second attempt results in dismissal from the program.

Dissertation Proposal

Each student must prepare a written dissertation proposal. While preparing this proposal, the student enrolls in CS 998 Doctoral Dissertation Proposal. The proposal must be presented to and approved by the dissertation committee. The committee determines whether the proposal has merit and can lead to significant contributions to the area and whether the student has the knowledge and skills to complete the proposed work successfully and in a timely manner. Students may present their dissertation proposal only after passing the comprehensive exam, and the presentation may not be on the same day as the comprehensive exam. If the student fails to defend the proposal, the student may present a dissertation proposal a second time at a later date. Failure in the second attempt results in dismissal from the program. On completing this requirement successfully, the student is advanced to candidacy for the PhD degree.

Dissertation Preparation and Defense

While preparing the dissertation, the candidate enrolls in CS 999 Doctoral Dissertation. When the work is deemed complete, the dissertation is defended. The public defense is preceded by a predefense meeting in which only the candidate, the dissertation committee members, and possibly the director of the PhD in Computer Science Program (or his or her representative) are present.
If the committee approves, the candidate may then schedule the final public defense. There should be at least one month between the predefense meeting and the defense, and the defense must be announced at least two weeks in advance. The dissertation must be made available to the committee at least two weeks in advance of the defense. The entire dissertation committee must be present at the defense, unless an exception is approved by the director of the PhD in Computer Science Program in advance of the defense. The dissertation must make significant contributions to its area and be publishable in refereed journals or conferences. If the candidate defends the dissertation successfully, the dissertation committee recommends that the final form of the dissertation be completed under the supervision of the dissertation director and the graduate faculty of Mason accept the candidate for the PhD degree. If the candidate fails to defend the dissertation, the candidate may request a second defense, following the same procedures as for the initial defense. There is no time limit for this request other than general time limits for the doctoral degree and an additional predefense is not required. A candidate who fails a second attempt to defend the dissertation is dismissed from the program.

Total: 72 credits

■ Electrical and Computer Engineering

Phone: 703-993-1569
Web: ece.gmu.edu

School: Volgenau School of Engineering

Faculty

Professors: Allnutt, Cook, Ephraim, Gertler, Griffiths, Ioannou, Jabbari, Levis, Manitius (chair), Mark, Mulpuri, Pancrazio

Associate professors: Berry, Chang, Gaj, Hintz, Pachowicz, Paris, W. Sutton, Wage

Assistant professors: Ikonomidou, Kaps, Li, Lorie, Nelson, Peixoto, Sikdar

Research professors: Katona, Wagenhals, Zaidi

Instructor: Pandula

Adjunct professors: Abgariah, Allen, Alper, Amos, Beatty, Bollino, Durie, Follendore, Fowler, Gong, Hall, Hassan, Herman, Hibey, Hockensmith, Hrnjez, Lazarevich, Leaf, McCaughey, Orebaugh, Osgood, Pollak, Sabzevari, Sheppard, Storev, Sud, Tham, Tran, Van Meter T, West S, Williams, Wilson, Wu, Young

Emeritus faculty: Baraniecki, Beale, Black, Schaefer, Tabak, Van Trees

The undergraduate education mission of the ECE Department is to provide a quality education for electrical engineering and computer engineering students to support the needs of Virginia and the nation.

The objectives of undergraduate programs within the ECE Department relate to the abilities of our graduates three to five years after graduation. These objectives include:

- Technical knowledge: Graduates will be able to apply the fundamentals in the appropriate engineering discipline as demonstrated by success as productive engineers in industry, government, or graduate school.
- Preparation for further study: Graduates will have the knowledge and skills to engage in lifelong learning.
• Professionalism: Graduates will have the skills and understanding needed to fulfill their professional responsibilities as engineers, including written and oral communication, ethics, and teamwork.

Graduate programs leading to MS and PhD degrees prepare students for careers in industry, government, and academia. Graduate certificate programs provide well-defined targets for students who want to advance or update their knowledge in selected areas. ECE offers the PhD in electrical and computer engineering, MS degrees in computer engineering, electrical engineering, telecommunications, and computer forensics, and certificates in communications, networking, and signal processing.

ECE is committed to high standards of teaching and research excellence in communications, digital systems design, computer networks, microprocessor and embedded systems, distributed computing, signal and image processing, control systems, intelligent systems, systems integration and microelectronics. Graduate students are offered a progressive environment with ample opportunities for the type of advanced research needed to confront the complex realities of the 21st century.

The courses in these programs are offered during the evening or late afternoon hours to accommodate students who are employed full time. For those who enter the programs on a full-time basis, some financial aid may be available in various forms, such as teaching assistantships, research assistantships, and work-study and co-op agreements with local industry.

Course Work

The Electrical and Computer Engineering (ECE) Department offers all courses designated ECE, CFRS and TCOM in the Courses chapter of this catalog. The department also offers some ENGR courses.

Undergraduate Degree

Computer Engineering, BS

Banner Code: VS-BS-CPE

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

The field of computer engineering can be described as a blend of electrical engineering and computer science. It is an amalgam of the computer hardware orientation of an electrical engineering program and the operating systems and languages of a computer science program. Computer engineers are involved in research, development, design, production, and operation of a wide variety of digital systems, from integrated circuits to computer systems and large-scale computer networks. Reflecting the industry trend to integrate hardware and software development, the computer engineering program is built around software running on advanced hardware that can simulate and assist in the design of new digital systems. Advanced software, such as VHDL, and software tools, such as logic and system design tools by Mentor Graphics and Cadence Design Systems, can be used to model hardware and hardware functionality from the system and architecture level down to the gate level and include relations to integrated circuit fabrication technology. Design and testing methodology involving these tools is taught in the program.

Career opportunities exist in engineering research and development, product design, digital system design and integration, engineering management, engineering consultancy, technical sales, and patent law, among others. The program provides a strong preparation for graduate study.

The bachelor’s program in computer engineering at Mason is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The computer engineering program is staffed by 25 full-time professors, including eight fellows of IEEE or other professional societies.
The curriculum provides a strong background in the fundamentals of computer engineering. A number of technical elective concentrations are offered, ranging from strongly hardware-oriented concentrations to strongly software-oriented ones. A major project with appropriate planning, documentation, and oral and written reports is required.

The requirements for the degree may be satisfied on a part-time or co-op basis. Cooperative education provides students the opportunity to integrate paid career-related work experience with classroom learning. Academic credit cannot be given for co-op experience. In addition to the usual financial aid available to all students through the Office of Student Financial Aid, computer engineering majors are eligible to apply through the ECE Department for several scholarships provided by professional societies and industrial organizations, including the Armed Forces Communications and Electronics Association, the Association of Old Crows, and the Institute of Electrical and Electronics Engineers.

Degree Requirements

All computer engineering students are strongly encouraged to see their major advisor each semester before course registration. Students interested in computer engineering who have not declared a major are also invited to obtain advising at the ECE Department office. Students are strongly encouraged to follow the sample schedule below to ensure that course prerequisites are satisfied.

Students must complete each ECE, ENGR, and CS course presented as part of the required 120 credits for the degree with a grade of C or better.

The 120 credits required for the BS in computer engineering are the University General Education* requirements and all of the following:

Electrical and Computer Engineering Credits: 46

- ECE 201 - Introduction to Signal Analysis Credits: 3
- ECE 220 - Signals and Systems I Credits: 3
- ECE 280 - Electric Circuit Analysis Credits: 5
- ECE 331 - Digital System Design Credits: 3
- ECE 332 - Digital Electronics and Logic Design Lab Credits: 1
- ECE 333 - Linear Electronics I Credits: 3
- ECE 334 - Linear Electronics Lab I Credits: 1
- ECE 445 - Computer Organization Credits: 3
- ECE 447 - Single-Chip Microcomputers Credits: 4
- ECE 448 - FPGA and ASIC Design with VHDL Credits: 4
- ECE 465 - Computer Networking Protocols Credits: 3
- ECE 491 - Engineering Seminar Credits: 1
- ECE 492 - Senior Advanced Design Project I Credits: 1
- ECE 493 - Senior Advanced Design Project II Credits: 2
- *Technical Electives Credits: 9

*Technical electives should be selected from the department’s list of approved technical elective concentrations. Students are also encouraged to propose additional technical elective concentrations for approval.

Computer Science Credits: 14
• CS 112 - Introduction to Computer Programming Credits: 4
• CS 211 - Object-Oriented Programming Credits: 3
• CS 262 - Introduction to Low-Level Programming Credits: 1
• CS 367 - Computer Systems and Programming Credits: 3
• CS 471 - Operating Systems Credits: 3

Mathematics and Statistics Credits: 23

• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• MATH 125 - Discrete Mathematics I Credits: 3
• MATH 203 - Linear Algebra Credits: 3
• MATH 213 - Analytic Geometry and Calculus III Credits: 3
• MATH 214 - Elementary Differential Equations Credits: 3
• STAT 346 - Probability for Engineers Credits: 3

Physics Credits: 11

• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1
• PHYS 262 - University Physics III Credits: 3

Engineering Credits: 2

• ENGR 107 - Introduction to Engineering Credits: 2

English, Communication, and Economics Credits: 9

• ENGH 302 - Advanced Composition Credits: 3
• COMM 100 - Public Speaking Credits: 3
• ECON 103 - Contemporary Microeconomic Principles Credits: 3
Additional University General Education Credits: 15

Students must complete all University General Education requirements not fulfilled by major requirements. General Education courses should be selected from the department's list of approved courses. The Synthesis general education requirement is satisfied by ECE 492 plus ECE 493.

- Written Communication (lower): 3 credits
- Literature: 3 credits
- Arts: 3 credits
- Western Civilization/World History: 3 credits
- Global Understanding: 3 credits

Note:

All students must submit at least 24 credits of social science and humanities course work, which is normally satisfied by the 24 credits of university general education social science and humanities courses listed above.

Total: 120 credits

Sample Schedule

The following presents a sample schedule that undergraduate computer engineering majors would pursue to obtain a bachelor’s degree.

First Semester Credits: 16

- CS 112 - Introduction to Computer Programming Credits: 4
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ENGH 101 - Composition Credits: 3
- ENGR 107 - Introduction to Engineering Credits: 2
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Second Semester Credits: 14

- CS 211 - Object-Oriented Programming Credits: 3
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 125 - Discrete Mathematics I Credits: 3
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
Third Semester Credits: 16

- Literature course (3 credits)
- ECE 201 - Introduction to Signal Analysis Credits: 3
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1

Fourth Semester Credits: 16

- ECE 220 - Signals and Systems I Credits: 3
- ECE 280 - Electric Circuit Analysis Credits: 5
- ECE 331 - Digital System Design Credits: 3
- ECE 332 - Digital Electronics and Logic Design Lab Credits: 1
- MATH 214 - Elementary Differential Equations Credits: 3
- CS 262 - Introduction to Low-Level Programming Credits: 1

Fifth Semester Credits: 16

- ECE 333 - Linear Electronics I Credits: 3
- ECE 334 - Linear Electronics Lab I Credits: 1
- ECE 445 - Computer Organization Credits: 3
- ENGH 302 - Advanced Composition Credits: 3
- STAT 346 - Probability for Engineers Credits: 3
- CS 367 - Computer Systems and Programming Credits: 3

Sixth Semester Credits: 13

- COMM 100 - Public Speaking Credits: 3
- CS 471 - Operating Systems Credits: 3
- PHYS 262 - University Physics III Credits: 3
- ECE 448 - FPGA and ASIC Design with VHDL Credits: 4

Seventh Semester Credits: 15

- Technical elective Credits: 3
Global understanding course Credits: 3
ECE 447 - Single-Chip Microcomputers Credits: 4
ECE 491 - Engineering Seminar Credits: 1
ECE 492 - Senior Advanced Design Project I Credits: 1
HIST 100 - History of Western Civilization Credits: 3 OR HIST 125 - Introduction to World History Credits: 3

Eighth Semester Credits: 14

- Technical elective Credits: 3
- Technical elective Credits: 3
- Arts course Credits: 3
- ECE 493 - Senior Advanced Design Project II Credits: 2
- ECE 465 - Computer Networking Protocols Credits: 3

Change of Major

Students who want to change their majors to computer engineering must have at least a 2.75 GPA in all math, physics, engineering, and computer science courses, and should have successfully completed MATH 114.

Writing-Intensive Requirement

Mason’s writing-intensive requirement is satisfied by the following group of three courses: ECE 333, ECE 445 and ECE 491 in which faculty provide feedback on student writing assignments. Drafts and revisions are required. Final evaluation of student's portfolio of writing assignments is done in ECE 491 Engineering Seminar.

Termination from the Major

No math, science or Volgenau School of Engineering course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Double Major Programs for Computer Engineering and Electrical Engineering

Computer engineering majors and electrical engineering majors can earn degrees with double majors in a number of disciplines. Computer engineering and computer science are frequently combined. Electrical engineering has been combined with computer engineering, computer science, physics or math. Details are available in the department brochures or at The Volgenau School web site volgenau.gmu.edu.

Electrical Engineering, BS

Banner Code: VS-BS-ELEN

School: Volgenau School of Engineering
Electrical engineering is a major field of modern technology. Electrical engineers are involved in research, development, design, production, and operation of a wide variety of devices and systems, including integrated circuits and microwave and laser devices, communication systems, control systems, radar, robots, large telecommunication networks, and power networks.

The bachelor’s program in electrical engineering at Mason is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The electrical engineering program is staffed by 25 full-time professors, including eight fellows of IEEE or other professional societies. The curriculum provides a strong background in the fundamentals of electrical engineering and senior-level courses in the important areas of electronics, networks, communications and signal processing, computer engineering, and controls and robotics. Further, the curriculum includes 9 credits of senior technical electives, 2 credits of advanced engineering labs, and 3 credits of senior advanced design project, which may be used for further concentration in one of these areas.

Career opportunities exist in engineering research and development, system design, system integration, engineering management, engineering consultancy, technical sales, and patent law, among others. The program provides a strong preparation for graduate study.

Degree requirements may be satisfied on a part-time or co-op basis. Cooperative education provides students with the opportunity to integrate paid career-related work experience with classroom learning. Academic credit is not given for co-op experience. In addition to the usual financial aid available to all students through the Office of Student Financial Aid, electrical engineering majors are eligible to apply at the ECE Department for several scholarships provided by professional societies and industrial organizations, including the Armed Forces Communications and Electronics Association, the Association of Old Crows, and the Institute of Electrical and Electronics Engineers.

Degree Requirements

All electrical engineering students are strongly encouraged to see their major advisor before course registration each semester. Students interested in electrical engineering who have not declared a major are also invited to obtain advising from the ECE Department. Students are strongly encouraged to follow the sample schedule below to ensure that course prerequisites are satisfied.

Students must complete each ECE, BENG and ENGR course presented as part of the required 120 credits for the degree with a grade of C or better.

For the BS Electrical Engineering degree, students must complete 120 credits, including all of the following:

Electrical and Computer Engineering Credits: 55

- ECE 101 - Information Technology for Electrical Engineers Credits: 3
- ECE 201 - Introduction to Signal Analysis Credits: 3
- ECE 220 - Signals and Systems I Credits: 3
- ECE 280 - Electric Circuit Analysis Credits: 5
- ECE 305 - Electromagnetic Theory Credits: 3
- ECE 320 - Signals and Systems II Credits: 3
- ECE 331 - Digital System Design Credits: 3
- ECE 332 - Digital Electronics and Logic Design Lab Credits: 1
- ECE 333 - Linear Electronics I Credits: 3
- ECE 334 - Linear Electronics Lab I Credits: 1
- ECE 421 - Classical Systems and Control Theory Credits: 3
• ECE 433 - Linear Electronics II Credits: 3
• ECE 445 - Computer Organization Credits: 3
• ECE 460 - Communication and Information Theory Credits: 3
• ECE 491 - Engineering Seminar Credits: 1
• ECE 492 - Senior Advanced Design Project I Credits: 1
• ECE 493 - Senior Advanced Design Project II Credits: 2
• Advanced Engineering Labs Credits: 2
• *Technical Electives Credits: 9

*Technical electives should be selected from the department’s list of approved courses. The required design content must be satisfied by the technical electives.

Computer Science Credits: 7

• CS 112 - Introduction to Computer Programming Credits: 4
• CS 222 - Computer Programming for Engineers Credits: 3

Mathematics and Statistics Credits: 20

• MATH 113 - Analytic Geometry and Calculus I Credits: 4
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• MATH 203 - Linear Algebra Credits: 3
• MATH 213 - Analytic Geometry and Calculus III Credits: 3
• MATH 214 - Elementary Differential Equations Credits: 3
• STAT 346 - Probability for Engineers Credits: 3

Physics Credits: 12

• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1
• PHYS 262 - University Physics III Credits: 3
• PHYS 263 - University Physics III Laboratory Credits: 1

Engineering Credits: 2
- ENGR 107 - Introduction to Engineering Credits: 2

English, Communication, and Economics Credits: 9

- ENGH 302 - Advanced Composition Credits: 3
- COMM 100 - Public Speaking Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3

Additional University General Education (15 credits)

Students must complete all University General Education requirements not fulfilled by major requirements. General Education courses should be selected from the department's list of approved courses. The Synthesis general education requirement is satisfied by ECE 492 and ECE 493.

- Written Communication (lower): 3 credits
- Literature: 3 credits
- Arts: 3 credits
- Western Civilization/World History: 3 credits
- Global Understanding: 3 credits

Note:

All students must submit at least 24 credits of social science and humanities course work, which is normally satisfied by the 24 credits of university general education social science and humanities courses listed above.

Concentrations

Concentrations are available within the electrical engineering baccalaureate program. Completion of specific science courses and senior-level courses leads to one of these designations on the student’s transcript on graduation. Concentration requirements may also meet some or all of the Advanced Engineering Lab and Technical Elective requirements.

▲ Concentration in Bioengineering (BIOE)

Students must complete:

- BIOL 213 - Cell Structure and Function Credits: 4 (Technical Elective plus Advanced Engineering Lab)
- ECE 434 - Linear Electronics II Laboratory Credits: 1 OR ECE 429 - Control Systems Lab Credits: 1
- ECE 492 - Senior Advanced Design Project I Credits: 1
- ECE 493 - Senior Advanced Design Project II Credits: 2 (bioengineering topic only)
And two courses from:

- BENG 301 - Bioengineering Measurements Credits: 3 AND BENG 302 - Bioengineering Measurements Lab Credits: 1
- BENG 304 - Modeling and Control of Physiological Systems Credits: 3
- BENG 525 - Neural Engineering Credits: 3
- BENG 499 - Special Topics in Bioengineering Credits: 0-4
- BENG 538 - Medical Imaging Credits: 3
- BENG 590 - Selected Topics in Bioengineering Credits: 3
- BINF 401 - Bioinformatics and Computational Biology I Credits: 3
- BIOL 425 - Human Physiology Credits: 3
- ECE 499 - Special Topics in Electrical Engineering Credits: 0-4 (bioengineering topic only)
- ECE 590 - Selected Topics in Engineering Credits: 3 (bioengineering topic only)

▲ Concentration in Communications and Signal Processing (CSP)

Students must complete:

- ECE 461 - Communication Engineering Laboratory Credits: 1
- ECE 492 - Senior Advanced Design Project I Credits: 1
- ECE 493 - Senior Advanced Design Project II Credits: 2 (with a communications and signal processing topic)

And three courses from:

- ECE 410 - Principles of Discrete-Time Signal Processing Credits: 3
- ECE 462 - Data and Computer Communications Credits: 3
- ECE 463 - Digital Communications Systems Credits: 3
- ECE 464 - Modern Filter Design Credits: 3
- ECE 465 - Computer Networking Protocols Credits: 3
- ECE 499 - Special Topics in Electrical Engineering Credits: 0-4 (communications and signal processing topic only)
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
- ECE 535 - Digital Signal Processing Credits: 3
- ECE 567 - Optical Fiber Communications Credits: 3
- ECE 590 - Selected Topics in Engineering Credits: 3 (communication and signal processing topic only)
- PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3

▲ Concentration in Computer Engineering (CPE)
Students must complete:

- ECE 447 - Single-Chip Microcomputers Credits: 4
- ECE 492 - Senior Advanced Design Project I Credits: 1
- ECE 493 - Senior Advanced Design Project II Credits: 2 (with a computer engineering topic)

And two courses from:

- ECE 431 - Digital Circuit Design Credits: 3
- ECE 437 - Principles of Microelectronic Device Fabrication Credits: 3
- ECE 448 - FPGA and ASIC Design with VHDL Credits: 4
- ECE 450 - Introduction to Robotics Credits: 3
- ECE 499 - Special Topics in Electrical Engineering Credits: 0-4 (computer engineering topic only)
- ECE 548 - Sequential Machine Theory Credits: 3
- ECE 590 - Selected Topics in Engineering Credits: 3
- CS 471 - Operating Systems Credits: 3

▲ Concentration in Control Systems (CON)

Students must complete:

- ECE 429 - Control Systems Lab Credits: 1
- ECE 492 - Senior Advanced Design Project I Credits: 1
- ECE 493 - Senior Advanced Design Project II Credits: 2 (with a control systems topic)

And three courses from:

- ECE 422 - Digital Control Systems Credits: 3
- ECE 447 - Single-Chip Microcomputers Credits: 4
- ECE 450 - Introduction to Robotics Credits: 3
- ECE 499 - Special Topics in Electrical Engineering Credits: 0-4 (control systems topic only)
- ECE 511 - Microprocessors Credits: 3
- ECE 521 - Modern Systems Theory Credits: 3
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
- ECE 549 - Theory and Applications of Artificial Neural Networks Credits: 3
- ECE 590 - Selected Topics in Engineering Credits: 3 (control systems topic only)
## Concentration in Electronics (ELE)

Students must complete:

- ECE 434 - Linear Electronics II Laboratory Credits: 1 **OR** ECE 435 - Digital Circuit Design Laboratory Credits: 1
- ECE 492 - Senior Advanced Design Project I Credits: 1
- ECE 493 - Senior Advanced Design Project II Credits: 2

And three courses from:

- ECE 430 - Principles of Semiconductor Devices Credits: 3
- ECE 431 - Digital Circuit Design Credits: 3
- ECE 437 - Principles of Microelectronic Device Fabrication Credits: 3
- ECE 447 - Single-Chip Microcomputers Credits: 4
- ECE 448 - FPGA and ASIC Design with VHDL Credits: 4
- ECE 499 - Special Topics in Electrical Engineering Credits: 0-4 (electronics topic only)
- ECE 520 - Applications of Analog and Digital Integrated Circuits Credits: 3
- ECE 563 - Introduction to Microwave Engineering Credits: 3
- ECE 565 - Introduction to Optical Electronics Credits: 3
- ECE 567 - Optical Fiber Communications Credits: 3
- ECE 584 - Semiconductor Device Fundamentals Credits: 3
- ECE 586 - Digital Integrated Circuits Credits: 3
- ECE 587 - Design of Analog Integrated Circuits Credits: 3
- ECE 590 - Selected Topics in Engineering Credits: 3 (electronics topic only)
- PHYS 306 - Wave Motion and Electromagnetic Radiation Credits: 3
- PHYS 308 - Modern Physics with Applications Credits: 3

Total: 120 credits

## Sample Schedule

The following is a sample schedule that an undergraduate electrical engineering major would follow to obtain a bachelor’s degree.

**First Semester Credits: 16**
• CS 112 - Introduction to Computer Programming Credits: 4
• ECON 103 - Contemporary Microeconomic Principles Credits: 3
• ENGR 107 - Introduction to Engineering Credits: 2
• ENGH 101 - Composition Credits: 3
• MATH 113 - Analytic Geometry and Calculus I Credits: 4

Second Semester Credits: 14

• CS 222 - Computer Programming for Engineers Credits: 3
• ECE 101 - Information Technology for Electrical Engineers Credits: 3
• MATH 114 - Analytic Geometry and Calculus II Credits: 4
• PHYS 160 - University Physics I Credits: 3
• PHYS 161 - University Physics I Laboratory Credits: 1

Third Semester Credits: 16

• Literature course Credits: 3
• ECE 201 - Introduction to Signal Analysis Credits: 3
• MATH 213 - Analytic Geometry and Calculus III Credits: 3
• MATH 203 - Linear Algebra Credits: 3
• PHYS 260 - University Physics II Credits: 3
• PHYS 261 - University Physics II Laboratory Credits: 1

Fourth Semester Credits: 15

• ECE 280 - Electric Circuit Analysis Credits: 5
• ECE 220 - Signals and Systems I Credits: 3
• MATH 214 - Elementary Differential Equations Credits: 3
• PHYS 262 - University Physics III Credits: 3
• PHYS 263 - University Physics III Laboratory Credits: 1

Fifth Semester Credits: 17

• Arts course Credits: 3
• ECE 320 - Signals and Systems II Credits: 3
• ECE 331 - Digital System Design Credits: 3
• ECE 332 - Digital Electronics and Logic Design Lab Credits: 1
• ECE 333 - Linear Electronics I Credits: 3
• ECE 334 - Linear Electronics Lab I Credits: 1
• STAT 346 - Probability for Engineers Credits: 3
Sixth Semester Credits: 15

- COMM 100 - Public Speaking Credits: 3
- ECE 421 - Classical Systems and Control Theory Credits: 3
- ECE 433 - Linear Electronics II Credits: 3
- ECE 445 - Computer Organization Credits: 3
- ECE 460 - Communication and Information Theory Credits: 3

Seventh Semester Credits: 15

- Advanced engineering lab Credits: 1
- Technical elective Credits: 3
- Global understanding course Credits: 3
- ECE 305 - Electromagnetic Theory Credits: 3
- ECE 491 - Engineering Seminar Credits: 1
- ECE 492 - Senior Advanced Design Project I Credits: 1
- ENGH 302 - Advanced Composition Credits: 3

Eighth Semester Credits: 12

- Advanced engineering lab Credits: 1
- Technical elective Credits: 3
- Technical elective Credits: 3
- ECE 493 - Senior Advanced Design Project II Credits: 2
- HIST 100 - History of Western Civilization Credits: 3 OR HIST 125 - Introduction to World History Credits: 3

Change of Major

Students who want to change their majors to electrical engineering must have at least a 2.75 GPA in all math, physics, engineering, and computer science courses, and should have successfully completed MATH 114.

Writing-Intensive Requirement

Mason’s writing-intensive requirement is satisfied by the following group of three courses: ECE 333, ECE 445 and ECE 491 in which faculty provide feedback on student writing assignments. Drafts and revisions are required. Final evaluation of student's portfolio of writing assignments is done in ECE 491 Engineering Seminar.

Termination from the Major
No math, science or Volgenau School of Engineering course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Double Major Programs for Computer Engineering and Electrical Engineering

Computer engineering majors and electrical engineering majors can earn degrees with double majors in a number of disciplines. Computer engineering and computer science are frequently combined. Electrical engineering has been combined with computer engineering, computer science, physics or math. Details are available in the department brochures or at the Volgenau School web site volgenau.gmu.edu.

Bachelor's/Accelerated Master's Program

Computer Engineering, BS/Computer Engineering, Accelerated MS

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

This program is for highly capable students who are interested in immediately continuing their undergraduate academic program in computer engineering into a graduate program. It allows for the completion of both bachelor's and master's degrees in computer engineering in five years with 144 credits.

Admission Requirements

Students can apply for the program during the semester in which they expect to complete 90 undergraduate credits applicable toward the BS degree. An overall GPA of at least 3.50 at the time of application is required. Criteria for admission are identical to criteria for admission to the MS in Electrical Engineering Program or the MS in Computer Engineering Program. Application is made using the accelerated graduate program application forms, and all usual requirements must be met. The accelerated program application form specifies the overlapping courses and details the 3.50 undergraduate GPA.

Degree Requirements

Students must complete 144 credits that satisfy all the requirements for the BS and MS degrees, with 6 credits overlap. Students take 6 credits of 500-level courses as part of their technical electives or substitutes for required courses as part of their 120-credit undergraduate program. The specific courses that may be taken and applied to the accelerated program will be specified by the ECE Department. Students may take additional graduate-level courses as part of their BS technical electives with advisor approval. These additional graduate-level courses will not count toward the MS degree. Students admitted to the accelerated program must maintain an overall GPA of at least 3.50 during the entire BS/MS program and present a GPA of at least 3.50 for the 24 credits of graduate work submitted for the MS degree.

Degree Conferral

Students must apply to have the BS in computer engineering conferred the semester before they expect to complete the BS requirements. At the completion of the MS requirements, the MS degree will be awarded.
Electrical Engineering, BS/Electrical Engineering, Accelerated MS

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

This program is for highly capable students who are interested in immediately continuing their undergraduate academic program in electrical engineering into a graduate program. It allows for the completion of both bachelor’s and master’s degrees in electrical engineering in five years with 144 credits.

Admission Requirements

Students can apply for the program during the semester in which they expect to complete 90 undergraduate credits applicable toward the BS degree. An overall GPA of at least 3.50 at the time of application is required. Criteria for admission are identical to criteria for admission to the MS in Electrical Engineering Program or the MS in Computer Engineering Program. Application is made using the accelerated graduate program application forms, and all usual requirements must be met. The accelerated program application form specifies the overlapping courses and details the 3.50 undergraduate GPA.

Degree Requirements

Students must complete 144 credits that satisfy all the requirements for the BS and MS degrees, with 6 credits overlap. Students take 6 credits of 500-level courses as part of their technical electives or substitutes for required courses as part of their 120-credit undergraduate program. The specific courses that may be taken and applied to the accelerated program will be specified by the ECE Department. Students may take additional graduate-level courses as part of their BS technical electives with advisor approval. These additional graduate-level courses will not count toward the MS degree. Students admitted to the accelerated program must maintain an overall GPA of at least 3.50 during the entire BS/MS program and present a GPA of at least 3.50 for the 24 credits of graduate work submitted for the MS degree.

Degree Conferral

Students must apply to have the BS in electrical engineering conferred the semester before they expect to complete the BS requirements. At the completion of the MS requirements, the MS degree will be awarded.

Electrical Engineering, BS/Telecommunications, Accelerated MS

School: The Volgenau School of Engineering

Department: Electrical and Computer Engineering

This program is for highly capable students who are interested in immediately continuing their undergraduate academic program in electrical engineering into a graduate program. It allows for the completion of both bachelor’s and master’s degrees in electrical engineering in five years with 144 credits.

Admission Requirements

Students can apply for the program during the semester in which they expect to complete 90 undergraduate credits applicable toward the BS degree. An overall GPA of at least 3.1 at the time of application is required. Criteria for admission are identical to criteria for admission to the MS in Telecommunications Program. Application is made using the accelerated graduate program
application forms, and all usual requirements must be met. The accelerated program application form specifies the overlapping courses and details the 3.1 undergraduate GPA.

Degree Requirements

Students must complete 144 credits that satisfy all the requirements for the BS and MS degrees, with 6 credits overlap. Students take 6 credits of 500-level courses as part of their technical electives or substitues for required courses as part of their 120-credit undergraduate program. Students may take additional graduate-level courses as part of their BS technical electives with advisor approval. These additional graduate-level courses will not count toward the MS degree. Students admitted to the accelerated program must maintain an overall GPA of at least 3.0 during the MS program and present a GPA of at least 3.0 for the 24 credits of graduate work submitted for the MS degree.

Students should take 6 credits from the following:

- TCOM 509 - Internet Protocols Credits: 1.5
- TCOM 529 - Advanced Internet Protocols Credits: 1.5
- TCOM 551 - Digital Communication Systems Credits: 3
- or approved substitutions

Degree Conferral

Students must apply to have the BS in electrical engineering conferred the semester before they expect to complete the BS requirements. At the completion of the MS requirements, the MS degree will be awarded.

Master's Degree

Computer Engineering, MS

Banner Code: VS-MS-CPE

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

The computer engineering field is at the interface of the computer science and electrical engineering disciplines because it involves knowledge of hardware and software development. A major distinction between computer engineering and computer science is that the computer engineer is more concerned with the physical implementation of computing devices, the interaction between hardware and software, and the methodologies for designing digital systems. Another major distinction between computer engineering and electrical engineering is that the computer engineer is more concerned with the computational aspects of electrical engineering problems and the implementation of these solutions in digital devices. The computer engineering program offers the following emphases: digital systems design, computer networks, distributed computing systems, microprocessor and embedded systems, and network and system security.

Admission
Admission is very competitive. The department’s policy is to admit only those students who have demonstrated a potential for outstanding performance in their graduate work.

**Admission Categories**

Each student may be admitted into one of the following categories: degree, provisional, or nondegree. Provisional admission is for anyone whose past performance provides reasonable, but not strong, evidence of ability to pursue graduate work. To advance to degree status, a provisional student must achieve a 3.00 GPA after 12 credits, remove all undergraduate deficiencies by completing the corresponding courses with grades of B or better, and receive Bs or better in two core courses specific to the student’s selected program and specialization. The nondegree category is used primarily by students who want to take courses but not necessarily pursue a degree. Nondegree students seeking to enter degree programs must formally apply for admission.

**Admission Requirements for Computer Engineering or Electrical Engineering Masters Program**

To be considered for admission to the master’s program, applicants should have a baccalaureate degree in electrical engineering, computer engineering, or a closely related discipline from an accredited program with a reputation for high academic standards, and have earned a GPA of B or better during the last 60 credits. Other requirements are as follows:

- Three letters of recommendation, preferably from academic references or references in industry or government who hold advanced degrees and are familiar with the applicant’s professional accomplishments
- Detailed statement of career goals and aspirations
- For students who have not earned a bachelor’s degree from a U.S. university, satisfactory performance on the GRE
- For students whose native language is not English, a minimum TOEFL score of 575 for the paper-based exam or 230 for the computer-based exam. A minimum score of 600 for the paper-based exam or 250 for the computer-based exam is required for applicants who wish to be considered for a graduate teaching assistantship.

**Non-ECE Students**

Students with BS or MS degrees in ECE-related disciplines (for example, computer science, mathematics, mechanical engineering, physics, or electrical engineering technology) are encouraged to apply for admission. They may initially be admitted into the provisional category and advance to degree status by satisfying requirements described in the Admissions Categories section. Such students may also be advised to take some courses from the undergraduate electrical or computer engineering curriculum, according to their intended specialization and specific backgrounds.

**Degree Requirements**

Students must complete a minimum of 30 graduate credits beyond the bachelor’s degree. This work must represent a cohesive set of courses leading to comprehensive knowledge in one emphasis area of computer engineering; it cannot be a set of disjointed courses.

The plan of study for the degree must include the following:

Two core courses (with B or better in each) from the following:
Minimum of 3 courses:

With a grade of B or better in each, at the 600 level and above (not including ECE 798 or 799), including approved doctoral courses (800 and 900 levels).

Electives:

The remaining courses must be taken from the list of approved computer engineering courses (available through the ECE and Computer Science Department offices and on the web), which includes selected courses offered by both departments.

The plan of study usually has no fewer than 15 credits of courses designated ECE.

Lists of courses appropriate for emphasis areas, such as digital systems design, computer networks, network and system security, and microprocessor and embedded systems, are available from the department office. A self-defined emphasis may be created when appropriate, with the approval of the computer engineering graduate program coordinator. This emphasis must include components of hardware and software development and the corresponding plan of study should comprise courses from ECE and the Computer Science Departments.

Total: 30 credits

Common Degree Requirements for CPE or ELEN Master’s Program

The following policies apply to students pursuing the MS in computer engineering or the MS in electrical engineering.

Student Advising

Newly admitted graduate students must consult with the ECE graduate coordinator before they register for classes. Students should make an appointment by calling the ECE office. Students are expected to select an emphasis from those available in each MS degree program. Students then are assigned an academic advisor from that specialization.

Plan of Study

Before the end of the second semester, each student must submit to the graduate coordinator’s office a plan of study that has been approved by the academic advisor. This plan should be kept up to date by regular consultation with the academic advisor. A final, signed version of the plan must be turned in when the student submits a graduation application.

Seminar Requirement

All degree candidates must attend a minimum of 10 graduate seminars approved for the given degree program.
GPA Requirements

A maximum of 6 credits of courses with grades of C or B- may be applied toward the degree. The student must present a GPA of at least 3.00 for all courses submitted for the degree.

Graduation Requirements

To complete requirements for graduation, students may select one of the following options:

Thesis Option

Students must complete ECE 799 Master’s Thesis (6 credits) and 24 credits of course work. The thesis is particularly recommended for those students who wish to develop and document their research skills or contemplate subsequent enrollment in a PhD program. The thesis involves a research effort, which is conducted under the guidance of a faculty advisor. In some cases, permission may be granted to complete a portion of the work at the student’s place of employment. The final written thesis and oral defense are approved by the student’s advisory committee.

For the electrical engineering program, this committee consists of at least three full-time faculty members, including two from the student’s major emphasis, and one from outside the emphasis. For the Computer Engineering Program, this committee consists of at least three full-time faculty members, including two affiliated with the MS in Computer Engineering Program, one of which must be from the ECE Department. Thesis students may not register for ECE 798 Research Project. Students must register for at least 3 credits of thesis for their first thesis semester. Following their first thesis semester, they must register for at least 1 credit of thesis each fall and spring semester until graduation.

Scholarly Paper Option

Students who select this option must complete 30 credits of course work or 27 credits of course work plus ECE 798 Research Project, and must present a scholarly paper. The scholarly paper, with the theme selected under the guidance of a faculty advisor, can be a technical report on an independent study or laboratory or computer experimentation; a literature search on a current scientific or technological topic, such as a survey of new technologies or new methodologies; or a case study of new applications. Students must demonstrate knowledge of the topic and make a satisfactory technical presentation of the paper in the graduate seminar. The scholarly paper and final presentation must be approved by the student’s advisory committee. When a student elects to submit an ECE 798 final report as a scholarly paper, it is expected that the 3 credits of effort in ECE 798 will result in a much more substantial paper than a scholarly paper submitted in addition to 30 credits of regular course work.

Computer Forensics, MS

Banner Code: VS-MS-CFRS

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

Computer forensics is a discipline addressing the collection, processing, and analysis of digital information so that this information can be admitted as evidence in a court of law. It is interdisciplinary in its nature with the inclusion of computer engineering, computer science, information technology, law, and ethics. Computer forensics is a key component in criminal, civil, intelligence, and counter-terrorism matters. In the last several years, with a proliferation of digital storage, transmission, and processing of sensitive information there has been an increase in the aberrant use of computers. This aberrant behavior includes but is not limited to: economic espionage, child exploitation, cybercrime, fraud, terrorism, and identity theft. In response to this, computer forensics has become an important profession serving both public and private sectors. The M.S. in Computer Forensics
will prepare graduates for careers in law enforcement, various other branches of government, and in the corporate sector such as banking and finance by combining academic education with real world practical techniques and by offering advanced training in analyzing digital evidence, in intrusion forensics, and in legal and ethical issues.

**Admission Requirements**

Students who hold a B.S. degree from an accredited college or university in engineering, math, science, computer science, business (with a quantitative background), economics, or other analytical disciplines; or students who have equivalent work experience indicating analytical aptitude; may apply to the M.S. in computer forensics. Depending on their background, some applicants may be required to complete 3 to 12 credits of preliminary course work before they are allowed to enroll in any of the core courses or specialty courses in the program. A minimum undergraduate GPA of 3.00 is required for acceptance.

**Degree Requirements**

Students must complete a minimum of 30 graduate credits beyond the bachelor’s degree with a GPA of 3.000 or higher, with no more than 6 credit hours of C grades. The plan of study includes an 18-credit required Core component which includes a mandatory capstone course and a 12-credit elective component as shown below:

**Core Courses (18 credits):**

- Choose one of the following:
  - CFRS 500 - Introduction to Technologies of Forensics Value Credits: 3
  - ISA 522 - Information Security Essentials Credits: 3
  - ISA 562 - Information Security Theory and Practice Credits: 3
- and complete the following:
  - CFRS 660 - Network Forensics Credits: 3
  - CFRS 661 - Digital Media Forensics Credits: 3
  - CFRS 664 - Incident Response Forensics Credits: 3
  - CFRS 760 - Legal and Ethical Issues in IT Credits: 3 or CFRS 770 - Fraud and Forensics in Accounting Credits: 3
  - CFRS 790 - Advanced Computer Forensics Credits: 3

**Elective courses (12 credits) chosen from:**

- CFRS 510 - Digital Forensics Analysis Credits: 3
- CFRS 663 - Operations of Intrusion Detection for Forensics Credits: 3
- CFRS 760 - Legal and Ethical Issues in IT Credits: 3 *
- CFRS 761 - Malware Reverse Engineering Credits: 3
- CFRS 762 - Mobile Device Forensics Credits: 3
- CFRS 770 - Fraud and Forensics in Accounting Credits: 3 *
- CFRS 780 - Advanced Topics in Computer Forensics Credits: 3
- ECE 511 - Microprocessors Credits: 3
- ECE 746 - Advanced Applied Cryptography Credits: 3
- ISA 650 - Security Policy Credits: 3
- ISA 652 - Security Audit and Compliance Testing Credits: 3
• ISA 656 - Network Security Credits: 3
• ISA 674 - Intrusion Detection Credits: 3
• ISA 785 - Research in Digital Forensics Credits: 3
• SOCI 607 - Criminology Credits: 3
• TCOM 662 - Advanced Secure Networking Credits: 3
• FRSC 510 - Basic Crime Analysis Credits: 3

Please note:

*Both CFRS 760 and CFRS 770 may be taken but only one may be used in the core component.

Other courses may be appropriate as elective courses in the degree program, but they must be approved prior to registration.

Total: 30 credits

Electrical Engineering, MS

Banner Code: VS-MS-ELEN

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

The electrical engineering program offers the following emphases: bioengineering, communications and networking, signal processing, control and robotics, microelectronics, and system architectures.

Admission

Admission Categories

Each student may be admitted into one of the following categories: degree, provisional, or nondegree. Provisional admission is for anyone whose past performance provides reasonable, but not strong, evidence of ability to pursue graduate work. To advance to degree status, a provisional student must achieve a 3.00 GPA after 12 credits, remove all undergraduate deficiencies by completing the corresponding courses with grades of B or better, and receive Bs or better in two core courses specific to the student’s selected program and emphasis. The nondegree category is used primarily by students who want to take courses but not necessarily pursue a degree. Nondegree students seeking to enter degree programs must formally apply for admission.

Admission Requirements for Computer Engineering or Electrical Engineering Masters Program

To be considered for admission to the master’s program, applicants should have a baccalaureate degree in electrical engineering, computer engineering, or a closely related discipline from an accredited program with a reputation for high academic standards, and have earned a GPA of B or better during the last 60 credits. Other requirements are as follows:
Three letters of recommendation, preferably from academic references or references in industry or government who hold advanced degrees and are familiar with the applicant’s professional accomplishments

- Detailed statement of career goals and aspirations
- For students who have not earned a bachelor’s degree from a U.S. university, satisfactory performance on the GRE
- For students whose native language is not English, a minimum TOEFL score of 575 for the paper-based exam or 230 for the computer-based exam. A minimum score of 600 for the paper-based exam or 250 for the computer-based exam is required for applicants who wish to be considered for a graduate teaching assistantship.

Non-ECE Students

Students with BS or MS degrees in ECE-related disciplines (for example, computer science, mathematics, mechanical engineering, physics, or electrical engineering technology) are encouraged to apply for admission. They may initially be admitted into the provisional category and advance to degree status by satisfying requirements described in the Admissions Categories section. Such students may also be advised to take some courses from the undergraduate electrical or computer engineering curriculum, according to their intended specialization and specific backgrounds.

Degree Requirements

Students must complete a minimum of 30 graduate credits beyond the bachelor’s degree. This work must represent a cohesive set of courses leading to comprehensive knowledge in one area; it cannot be a set of disjointed courses. The plan of study for the degree must include the following:

Two core courses, with a B or better in each, from the following:

- ECE 521 - Modern Systems Theory Credits: 3
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
- ECE 548 - Sequential Machine Theory Credits: 3 or ECE 511 - Microprocessors Credits: 3
- ECE 584 - Semiconductor Device Fundamentals Credits: 3 or ECE 565 - Introduction to Optical Electronics Credits: 3

and

Minimum of three courses, with a B or better in each, at the 600 level or above (not including ECE 798 or 799) from a chosen specialization, including approved doctoral courses (800 and 900 levels).

Note:

A maximum of 6 credits of non-ECE courses may be used, subject to prior department approval. Approved IT courses (including doctoral 800- and 900-level courses) that cover ECE topics may be taken for credit toward an MS in electrical engineering, subject to prior department approval, in addition to the 6 credits of non-ECE courses.

Common Degree Requirements for CPE or ELEN Master's Program

The following policies apply to students pursuing the MS in computer engineering or the MS in electrical engineering.
Student Advising

Newly admitted graduate students must consult with the ECE graduate coordinator before they register for classes. Students should make an appointment by calling the ECE office. Students are expected to select an emphasis from those available in each MS degree program. Students then are assigned an academic advisor from that emphasis area.

Plan of Study

Before the end of the second semester, each student must submit to the graduate coordinator’s office a plan of study that has been approved by the academic advisor. This plan should be kept up to date by regular consultation with the academic advisor. A final, signed version of the plan must be turned in when the student submits a graduation application.

Seminar Requirement

All degree candidates must attend a minimum of 10 graduate seminars approved for the given degree program.

GPA Requirements

A maximum of 6 credits of courses with grades of C or B- may be applied toward the degree. The student must present a GPA of at least 3.00 for all courses submitted for the degree.

Graduation Requirements

To complete requirements for graduation, students may select one of the following options:

Thesis Option

Students must complete ECE 799 Master’s Thesis (6 credits) and 24 credits of course work. The thesis is particularly recommended for those students who wish to develop and document their research skills or contemplate subsequent enrollment in a PhD program. The thesis involves a research effort, which is conducted under the guidance of a faculty advisor. In some cases, permission may be granted to complete a portion of the work at the student’s place of employment. The final written thesis and oral defense are approved by the student’s advisory committee.

For the electrical engineering program, this committee consists of at least three full-time faculty members, including two from the student’s major specialization, and one from outside the specialization. For the Computer Engineering Program, this committee consists of at least three full-time faculty members, including two affiliated with the MS in Computer Engineering Program, one of which must be from the ECE Department. Thesis students may not register for ECE 798 Research Project. Students must register for at least 3 credits of thesis for their first thesis semester. Following their first thesis semester, they must register for at least 1 credit of thesis each fall and spring semester until graduation.

Scholarly Paper Option

Students who select this option must complete 30 credits of course work or 27 credits of course work plus ECE 798 Research Project, and must present a scholarly paper. The scholarly paper, with the theme selected under the guidance of a faculty advisor, can be a technical report on an independent study or laboratory or computer experimentation; a literature search on a current scientific or technological topic, such as a survey of new technologies or new methodologies; or a case study of new applications. Students must demonstrate knowledge of the topic and make a satisfactory technical presentation of the paper in the graduate seminar. The scholarly paper and final presentation must be approved by the student’s advisory committee. When a student elects to submit an ECE 798 final report as a scholarly paper, it is expected that the 3 credits of effort in ECE 798 will result in a much more substantial paper than a scholarly paper submitted in addition to 30 credits of regular course work.
Telecommunications, MS

Banner Code: VS-MS-TCOM

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

The innovative, interdisciplinary MS in Telecommunications Program provides a blend of cutting-edge engineering-oriented courses in wireless and fiber communications systems, networks, computers, and Internet protocols, combined with courses on telecommunications policy, legal, business, and international aspects. The interdisciplinary program is designed for students who wish to enter the field of telecommunications or are working in the field and want to advance their knowledge of telecommunications. It concentrates on practical applications of telecommunications rather than on a theoretical approach. It focuses on the engineering and IT aspects of telecommunications, in combination with the interdisciplinary knowledge offered by selected courses in telecommunications business and policy. More than 30 new engineering and IT courses have been designed especially for this program, including four certificate programs that may be incorporated into, and taken concurrently with, the MS in telecommunications.

A novelty of the program is its structure, which consists of four emphasis areas. The program offers a mix of 3-credit full-semester courses together with 1.5-credit half-semester courses. This structure allows students to identify more clearly the various specialties in telecommunications technology. Students enjoy considerable flexibility because they are able to design their master’s programs to fit their technical preferences, including the option of taking courses in other programs at Mason.

A majority of the course material comes from the Electrical and Computer Engineering (ECE) Department and the Systems Engineering and Operations Research (SEOR) Department. Courses offered by ECE focus on network technologies, such as fiber optics, and Internet protocols; network applications, such as networked multicomputer systems, client-server architectures, and network management; and wireless communications, such as digital communications, satellite communications, mobile communications, and GPS.

Unique courses in the telecommunications program, such as Border Gateway Protocols, Interior Gateway Protocols, MPLS, GPS, and Advanced Link Design, complement courses given in ECE programs. In addition to the many new telecommunications courses developed for this program, ECE already offers a number of other graduate courses in communications as part of the graduate electrical engineering and computer engineering programs. Those courses may also be taken for credit under the MS in Telecommunications Program, provided students have the prerequisite background. Courses related to systems engineering, project management, and business of telecommunications (including the design and optimization of large, complex communication networks) are offered by SEOR. Both SEOR fields, systems engineering and operations research, play significant roles in all aspects of the design, operation, and business of telecommunications, and this knowledge is important for students of telecommunications.

The blend of in-depth knowledge of specific elements of telecommunications technology, combined with knowledge of broader issues in telecommunications, is increasingly necessary for people who intend to work in a management or decision-making position within the telecommunications industry, telecommunications-related businesses, or government institutions dealing with telecommunications. The MS in telecommunications provides that blend.

**Program Format**

The program consists of 9 credits of mandatory engineering and technology core courses (TCOM 500, 501, 502, and 521); 6 credits of electives drawn from an interdisciplinary group of core courses (PUBP 726, TCOM 547, or TCOM 750), and a basic switching lecture and laboratory course (TCOM 514) or an Internet protocol routing lecture and laboratory course (TCOM 515); and four areas of emphasis. Students who enter the program with an undergraduate degree that shows evidence of successfully
completing LAN and WAN technologies may substitute TCOM 509 and TCOM 529 for TCOM 501 and TCOM 502 in their mandatory core program, respectively.

Students must complete 30 credits of course work through a combination of core and emphasis courses. The core consists of 15 credits, with the remaining 15 credits earned in areas of emphasis. The emphases are subareas of telecommunications that provide necessary depth.

Students are usually expected to take courses from at least two emphasis areas. Up to 6 credits from the core program may be carried forward into the emphases, thus permitting up to 6 credits of electives to be taken inside or outside the prime emphasis area chosen by the student. TCOM 501/502 may be carried forward into emphasis area 1, 2, or 3; TCOM 521 may be carried forward into emphasis area 4. Double counting is not permitted, but the courses carried forward into a given emphasis may permit that area's credit requirement to be satisfied, thus allowing elective courses to be taken outside that area. Usually, a minimum of 6 credits is needed to satisfy one emphasis area. Credit for each emphasis can be obtained by taking an appropriate combination of full-semester courses (3 credits) and half-semester courses (1.5 credits). In many cases, a pair of coordinated, half-semester courses (for example, TCOM 503/513 on fiber optic communications and networks) permits students to take a half-semester course to get an introduction to the field or the equivalent of a full-semester course for a more complete knowledge of that topic.

Admission Requirements

Courses are open to students who hold a BS or BA degree from an accredited college or university in engineering, math, science, computer science, business (with a quantitative background), economics, or other analytical disciplines, and students who have equivalent work experience indicating analytical aptitude. Depending on their background, some applicants may be required to complete 3 to 6 credits of preliminary course work before they are allowed to enroll in any of the core courses or emphasis courses in the program. Applicants who have not studied mathematics beyond the equivalent of algebra II/trigonometry at high school or introductory calculus classes (such as those offered in business or database management programs) will be required to take TCOM 575, the foundation course that prepares students for TCOM 500, prior to being allowed to take TCOM 500. A minimum undergraduate GPA of 3.00 is usually required.

Students may be admitted to the MS program as degree seeking students, or they may be admitted for nondegree study within the program, which allows them to take individual courses. Students in the nondegree program may apply to the degree program, provided their GPA within the MS in Telecommunications Program is 3.00 or above. Up to 12 credits earned in nondegree study may be transferred into the degree program, provided each of the courses to be transferred in was passed with a grade of B or above.

Degree Requirements

Students must complete a minimum of 30 graduate credits with a GPA of 3.00 or higher. Students must earn a B (3.00) or above in core courses TCOM 500, 501, 502, and 521. Up to 6 credits of a combination of C grades may be carried within the program from the remaining core courses or from the emphasis courses, provided the overall GPA is 3.00 or higher.

The plan of study includes the following:

15 credits of core courses, subject to the following constraints:

Required Courses (9 credits)
- TCOM 500 - Modern Telecommunications Credits: 3
- TCOM 501 - Data Communications and Local Area Networks Credits: 1.5 or TCOM 509 - Internet Protocols Credits: 1.5 *
- TCOM 502 - Wide Area Networks and Internet Credits: 1.5 or TCOM 529 - Advanced Internet Protocols Credits: 1.5 *
- TCOM 521 - Systems Engineering for Telecommunications Management Credits: 3

**Note:**

*Students must receive prior permission to substitute TCOM 509 for TCOM 501 or TCOM 529 for TCOM 502.*

**Elective core courses (6 credits selected from the following):**

- PUBP 726 - Telecommunications Policy Credits: 3
- TCOM 514 - Basic Switching: Lecture and Laboratory Course Credits: 3 *
  or
- TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course Credits: 3 *
- TCOM 547 - Project Management in Telecommunications Credits: 3
- TCOM 750 - Coordinating Seminar Credits: 3

**Note:**

*Both TCOM 514 and TCOM 515 may be taken for credit, but only one may be used to satisfy a core elective requirement.*

**Students must take a minimum of 15 credits of courses listed under the following areas of emphasis:**

Students usually take 15 credits from at least two of the four emphasis areas, or they may elect to take all 15 credits from the systems engineering of telecommunications area (emphasis 4). Students electing to carry forward a core course (TCOM 501/502 or TCOM 521) into an appropriate emphasis area have the option of taking an elective course in that area or an alternate area to bring the total number of credits in the emphasis area to 15.

An area of emphasis can be completed by a combination of full-semester courses and half-semester courses listed under the emphasis or considered applicable to that area for a total of at least 6 credits. Some emphasis courses are in more than one area; for example, TCOM 509 Internet Protocols is in emphasis 1, network technologies, and emphasis 2, network applications. Half-semester 1.5-credit courses may only be counted in one emphasis area, even if they apply to more than one. Full-semester 3-credit courses may be counted in one emphasis area or split between two. For example, TCOM 551 Digital Communication Systems, which is in emphases 1 and 3, may be counted as 3 credits in either area, or 1.5 credits in each area.

Basic courses in each emphasis have been specially designed for the telecommunications program. These courses do not require completion of prerequisites from other MS programs in the Volgenau School. Other courses, which are marked with asterisks, are from other MS programs in the Volgenau School and represent viable options for students who have appropriate prerequisites in some technical areas. Although these courses assume certain prerequisites from their specific MS programs, advanced students who already know the prerequisite material can seek instructor permission to enroll in those courses.
Alternatives to completing each emphasis area by using appropriate combinations of courses not listed under a given module may be admissible subject to prior approval by the program director. In addition, independent study, reading, and research courses may be taken in all five areas. These courses permit students to make use of their work experiences to undertake non-classroom courses for credit within the program.

Mason has negotiated an articulation agreement with the University of Virginia that allows up to 12 credits of the Informational Systems Management Certificate Program from the University of Virginia to be transferred into emphasis area 4 of the TCOM Program. In addition, graduate students from the National Defense University (NDU) may transfer up to 9 credits from NDU’s Information Security Certificate Program.

A capstone project course, TCOM 699, is required under the systems engineering of telecommunications area (emphasis 4) should the student elect to take all 15 credits in this area. Students taking only 7.5 credits in emphasis 4 have the option of taking TCOM 699, but the course is not required unless the student takes all 15 credits in emphasis 4.

**Areas of Emphasis**

Courses listed below from other graduate programs in the Volgenau School listed can be taken for credit in this program if the student has the appropriate prerequisites. Other courses from other programs may be taken for credit, with prior approval.

**Emphasis 1, Network Technologies**

- TCOM 503 - Fiber Optic Communications Credits: 1.5
- TCOM 505 - Networked Multicomputer Systems Credits: 1.5
- TCOM 509 - Internet Protocols Credits: 1.5
- TCOM 510 - Client-Server Architectures and Applications Credits: 1.5
- TCOM 513 - Optical Communications Networks Credits: 1.5
- TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course Credits: 3
- TCOM 519 - Voice over IP Credits: 1.5
- TCOM 529 - Advanced Internet Protocols Credits: 1.5
- TCOM 539 - Advanced Voice over IP Credits: 1.5
- TCOM 548 - Security and Privacy Issues in Telecommunications Credits: 1.5
- TCOM 551 - Digital Communication Systems Credits: 3
- TCOM 556 - Cryptography and Network Security Credits: 1.5
- TCOM 562 - Network Security Fundamentals Credits: 3
- TCOM 609 - Interior Gateway Protocol (IGP) Routing Credits: 3
- TCOM 610 - Border Gateway Protocol (BGP) Routing Credits: 3
- TCOM 660 - Network Forensics Credits: 3
- TCOM 661 - Digital Media Forensics Credits: 3
- TCOM 663 - Operations of Intrusion Detection and Forensics Credits: 3
- TCOM 664 - Incident Response Forensics Credits: 3
- ECE 542 - Computer Network Architectures and Protocols Credits: 3
- ECE 565 - Introduction to Optical Electronics Credits: 3
- ECE 642 - Design and Analysis of Computer Communication Networks Credits: 3
- ECE 643 - Network Switching and Routing Credits: 3
- CS 571 - Operating Systems Credits: 3
- CS 756 - Performance Analysis of Computer Networks Credits: 3
Emphasis 2, Network Applications

- TCOM 505 - Networked Multicomputer Systems Credits: 1.5
- TCOM 509 - Internet Protocols Credits: 1.5
- TCOM 510 - Client-Server Architectures and Applications Credits: 1.5
- TCOM 513 - Optical Communications Networks Credits: 1.5
- TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course Credits: 3
- TCOM 519 - Voice over IP Credits: 1.5
- TCOM 529 - Advanced Internet Protocols Credits: 1.5
- TCOM 539 - Advanced Voice over IP Credits: 1.5
- TCOM 548 - Security and Privacy Issues in Telecommunications Credits: 1.5
- TCOM 555 - Network Management Foundations and Applications Credits: 3
- TCOM 556 - Cryptography and Network Security Credits: 1.5
- TCOM 562 - Network Security Fundamentals Credits: 3
- TCOM 609 - Interior Gateway Protocol (IGP) Routing Credits: 3
- TCOM 610 - Border Gateway Protocol (BGP) Routing Credits: 3
- TCOM 611 - Multi-Protocol Label Switching (MPLS) Credits: 3
- TCOM 660 - Network Forensics Credits: 3
- TCOM 662 - Advanced Secure Networking Credits: 3
- TCOM 663 - Operations of Intrusion Detection and Forensics Credits: 3
- TCOM 664 - Incident Response Forensics Credits: 3
- ECE 646 - Cryptography and Computer Network Security Credits: 3
- CS 756 - Performance Analysis of Computer Networks Credits: 3
- INFS 612 - Principles and Practices of Communication Networks Credits: 3
- INFS 640 - Introduction to Electronic Commerce Credits: 3

Emphasis 3, Wireless Communications

- TCOM 516 - Global Positioning System (GPS) Credits: 1.5
- TCOM 526 - Advanced Global Positioning System (GPS) Credits: 1.5
- TCOM 551 - Digital Communication Systems Credits: 3
- TCOM 552 - Introduction to Mobile Communications Systems Credits: 3
- TCOM 562 - Network Security Fundamentals Credits: 3
- TCOM 606 - Advanced Mobile Communications Systems Credits: 3
- TCOM 607 - Satellite Communications Credits: 3
- TCOM 660 - Network Forensics Credits: 3
- TCOM 707 - Advanced Link Design Credits: 3
- ECE 732 - Mobile Communication Systems Credits: 3
- ECE 741 - Wireless Networks Credits: 3

Emphasis 4, Systems Engineering of Telecommunications
This area of emphasis can be taken as one of two emphases or as one 15-credit emphasis. No more than two SYST courses can be taken within this area.

- TCOM 547 - Project Management in Telecommunications Credits: 3
- TCOM 548 - Security and Privacy Issues in Telecommunications Credits: 1.5
- TCOM 699 - Telecommunications Project Course Credits: 3
- SYST 510 - Systems Definition and Cost Modeling Credits: 3
- SYST 513 - Total Systems Engineering, Reengineering and Enterprise Integration Credits: 3
- SYST 520 - System Engineering Design Credits: 3
- SYST 542 - Decision Support Systems Engineering Credits: 3
- INFS 612 - Principles and Practices of Communication Networks Credits: 3
- INFS 614 - Database Management Credits: 3
- INFS 640 - Introduction to Electronic Commerce Credits: 3
- ITRN 772 - International Telecommunications Credits: 3

Total: 30 credits

Applicable BS/Accelerated MS in Telecommunications Programs

These degree programs may be taken as part of an accelerated MS in Telecommunications Program with three undergraduate degree programs: BS in systems engineering, information technology, and individualized studies. See respective undergraduate degree information for details.

Systems Engineering, BS/Telecommunications, Accelerated MS
Applied Information Technology, BS/Telecommunications, Accelerated MS
Individualized Study, BIS/Telecommunications, Accelerated MS

Telecommunications Certificates

Five 15-credit certificates are offered by the MS in TCOM Program. Students may pursue these certificates as stand-alone programs or as part of their degree program. For the former, they are required to submit a graduate program application indicating their desire to enroll in the appropriate graduate certificate program. For the latter, because they are already enrolled in a degree program, they need only add the appropriate graduate certificate to their graduate program status at least one semester prior to the award of the certificate. The courses within the certificates are drawn directly from the MS in TCOM Program. If a student initially signs up for only a certificate program, it is possible to transfer into the degree program later, transferring up to 12 credits into the degree program. Students must therefore ensure they have transferred into the degree program prior to starting course work beyond 12 credits in the certificate program to ensure that all credits from the certificate program may transfer into the degree program. Students who transfer from a certificate program into the degree program may earn the certificate and the degree on satisfactory completion of the respective requirements. Applicable courses may count for the certificate and the degree programs.

Students may transfer in one 3-credit course from another program or institution toward their TCOM certificate, provided the course in question was passed with a B grade or higher. Students are permitted to carry one C grade within their certificate program, provided the overall GPA is 3.00 or above.

Advanced Networking Protocols for Telecommunications Graduate Certificate
Network Technologies and Applications Graduate Certificate
Master's Level Certificate

Advanced Networking Protocols for Telecommunications Graduate Certificate

Banner Code: VS-CERG-ANPT

College: Volgenau School of Engineering

Department: Electrical and Computer Engineering

This certificate provides an in-depth understanding of advanced protocols used in a variety of telecommunications networks.

The graduate certificate may be pursued on a part-time or full-time basis.

Certificate Requirements

To obtain the certificate students must complete the following for a total of 15 credits:

Core Courses (9 credits)

- TCOM 609 - Interior Gateway Protocol (IGP) Routing Credits: 3
- TCOM 610 - Border Gateway Protocol (BGP) Routing Credits: 3
  and 3 credits chosen from the following:
  - TCOM 509 - Internet Protocols Credits: 1.5 and TCOM 529 - Advanced Internet Protocols Credits: 1.5
  or
  - TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course Credits: 3

Elective Courses (6 credits)

Choose from the following:

- TCOM 509 - Internet Protocols Credits: 1.5
- TCOM 529 - Advanced Internet Protocols Credits: 1.5
- TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course Credits: 3
- TCOM 519 - Voice over IP Credits: 1.5
- TCOM 539 - Advanced Voice over IP Credits: 1.5
- TCOM 611 - Multi-Protocol Label Switching (MPLS) Credits: 3
- TCOM 662 - Advanced Secure Networking Credits: 3
Note:

TCOM 509/529 and TCOM 515 cannot be taken twice. If a student takes TCOM 509 and 529 or TCOM 515 in the core element, the course(s) may not be taken again in the elective element.

Total: 15 credits

Communications and Networking Graduate Certificate

Banner Code: VS-CERG-CONE

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

This certificate provides graduate students with the opportunity to reach a demonstrated level of competence in communications and networking. Course work toward the graduate certificate may be used for credit toward the MS in electrical engineering or computer engineering; however, the certificate’s primary purpose is to provide a well-defined body of knowledge for students who want to advance their understanding of modern communications but do not necessarily want to complete requirements for the MS degree. The certificate may be pursued concurrently with any of the graduate degree programs in the Volgenau School.

The graduate certificate may only be pursued on a part-time basis.

Admission Requirements

The certificate program in communications and networking is open to all students who hold BS degrees in scientific and engineering disciplines from accredited universities.

Certificate Requirements

The certificate is awarded on completion of five graduate courses (15 credits) in communications and networking. A cumulative GPA of 3.00 is required and one course with a grade of C at most may be applied toward the certificate. The certificate courses comprise two required foundation courses and three elective courses.

Foundation courses (6 credits):

- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
- ECE 542 - Computer Network Architectures and Protocols Credits: 3

Elective courses (9 credits):

After completing the foundation courses, students choose electives by taking three courses from the following:

- ECE 535 - Digital Signal Processing Credits: 3
Network Technologies and Applications Graduate Certificate

**Banner Code:** VS-CERG-NETT

**School:** Volgenau School of Engineering

**Department:** Electrical and Computer Engineering

The certificate provides a broad understanding of the technologies used in telecommunications networks and the various applications of telecommunications networks.

The graduate certificate may be pursued on a part-time or full-time basis.

To obtain the certificate, students must complete the following, for a total of 15 credits:

**Certificate Requirements**

Choose 9 credits from the following:

- TCOM 504 - Asynchronous Transfer Mode Networks Credits: 1.5
- TCOM 505 - Networked Multicomputer Systems Credits: 1.5
- TCOM 509 - Internet Protocols Credits: 1.5
- TCOM 510 - Client-Server Architectures and Applications Credits: 1.5
- TCOM 519 - Voice over IP Credits: 1.5
Elective Requirements

Six credits are required. Students may elect to take any additional 6 credits from the Telecommunications MS emphasis areas 1, 2, and 3, including those in the mandatory course list that are not part of the 9 credits of core courses for the certificate.

Total: 15 credits

Networks, System Integration and Testing Graduate Certificate

Banner Code: VS-CERG-NSIT

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

This certificate provides graduate students with the opportunity to reach a demonstrated level of competence in computer networks, system integration, and software testing. Course work toward the graduate certificate may be used for credit toward the MS in electrical engineering or computer engineering; however, the certificate’s primary purpose is to provide a well-defined program for students who want to advance their knowledge of modern networks, systems integration and testing, but do not necessarily want to complete requirements for the MS degree. The certificate may be pursued concurrently with any of the graduate degree programs in the Volgenau School.

The graduate certificate may only be pursued on a part-time basis.

Admissions Requirements

The networks, system integration, and testing certificate program is open to all students who hold BS degrees in scientific and engineering disciplines from accredited universities, with a GPA minimum established by The Volgenau School for all MS programs.

Certificate Requirements

The certificate is awarded on successful completion of five graduate courses (15 credits) from the list of courses given below. A cumulative GPA of 3.00 is required, one course with a grade of C at most may be applied toward the certificate, and no more than one, 3-credit graduate course in the appropriate discipline may be transferred into the certificate from an appropriately accredited program at another institute of higher learning.

The certificate in networks, systems integration, and testing consists of the following five, 3-credit courses:

- ECE 542 - Computer Network Architectures and Protocols Credits: 3
- ECE 673 - Discrete Event Systems Credits: 3
- ECE 674 - Systems Architecture Design Credits: 3
Total: 15 credits

Signal Processing Graduate Certificate

Banner Code: VS-CERG-SIGP

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

The Department of Electrical and Computer Engineering, in conjunction with the Department of Statistics, offers the certificate in signal processing, which provides graduate students with an opportunity to reach a demonstrated level of competence in signal processing. Course work for the graduate certificate can be used for credit toward the MS in statistical science as well as the MS in electrical or computer engineering. However, the certificate’s primary purpose is to provide a well-defined body of information for students who want to advance or update their knowledge in this fast-moving field, but who do not necessarily wish to complete requirements for the MS degree. The certificate may be pursued concurrently with any of the graduate degree programs in the Volgenau School.

The graduate certificate may only be pursued on a part-time basis.

Admission Requirements

The program is open to all students who hold BS degrees in scientific and engineering disciplines from accredited universities and hold graduate status (either degree or non-degree) in the Volgenau School.

Certificate Requirements

The certificate is awarded on completion of five graduate courses (15 credits) in signal processing. A cumulative GPA of 3.00 is required, and one course with a grade of C at most may be applied toward the certificate. The certificate courses comprise two foundation courses taken by all students and three elective courses.

Foundation courses (6 credits):

- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3 or STAT 544 - Applied Probability Credits: 3
- ECE 535 - Digital Signal Processing Credits: 3

Elective courses (9 credits):

After completing the two foundation courses, students choose electives by taking three courses from the following list:
- ECE 537 - Introduction to Digital Image Processing (DIP) Credits: 3
- ECE 621 - Systems Identification Credits: 3
- ECE 630 - Statistical Communication Theory Credits: 3
- ECE 635 - Adaptive Signal Processing Credits: 3
- ECE 638 - Fast Algorithms and Architectures for Digital Signal Processing Credits: 3 or ECE 644 - Architectures and Algorithms for Image Processing Credits: 3
- ECE 722 - Kalman Filtering with Applications Credits: 3 or ECE 728 - Random Processes in Electrical and Computer Engineering Credits: 3
- ECE 734 - Detection and Estimation Theory Credits: 3 or ECE 738 - Advanced Digital Signal Processing Credits: 3
- CSI 978 - Statistical Analysis of Signals Credits: 3
- CSI 672 or STAT 652 - Statistical Inference Credits: 3
- CSI 678 or STAT 658 - Time Series Analysis and Forecasting Credits: 3
  Any one of the following:
- ECE 751 - Information Theory Credits: 3
- ECE 752 - Spectral Estimation Credits: 3
- ECE 754 - Optimum Array Processing I Credits: 3
- ECE 755 - Optimum Array Processing II Credits: 3
- ECE 749 - Neural Networks for Control Credits: 3
- CS 775 - Advanced Pattern Recognition Credits: 3

Total: 15 credits

Telecommunications Forensics and Security Graduate Certificate

Banner Code: VS-CERG-TFAS

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

The objective of this certificate is to provide an in-depth understanding of security and forensics as they apply to networks and digital storage media.

The graduate certificate may be pursued on a part-time or full-time basis.

Certificate Requirements

Students must complete the following for a total of 15 credits:

Core Courses

Choose 9 credits from the following:

- TCOM 562 - Network Security Fundamentals Credits: 3 or ISA 562 - Information Security Theory and Practice Credits: 3

One of the following:
- TCOM 548 - Security and Privacy Issues in Telecommunications Credits: 1.5 and TCOM 556 - Cryptography and Network Security Credits: 1.5
  or
- TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course Credits: 3
One of the following:
- TCOM 660 - Network Forensics Credits: 3
- TCOM 661 - Digital Media Forensics Credits: 3
- TCOM 663 - Operations of Intrusion Detection and Forensics Credits: 3
- TCOM 664 - Incident Response Forensics Credits: 3

**Elective Courses**

Choose 6 credits from the following:

- ISA 562 - Information Security Theory and Practice Credits: 3 (formerly ISA 662, and prior to that INFS 762)
- TCOM 660 - Network Forensics Credits: 3
- TCOM 661 - Digital Media Forensics Credits: 3
- TCOM 662 - Advanced Secure Networking Credits: 3
- TCOM 663 - Operations of Intrusion Detection and Forensics Credits: 3
- TCOM 664 - Incident Response Forensics Credits: 3

**Note:**

TCOM 660, 661, 663, and 664 cannot be taken twice for credit. If any of these courses is taken in the core element, it cannot be taken again in the elective element.

**Total: 15 credits**

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**Wireless Communications Graduate Certificate**

**Banner Code:** VS-CERG-WIRE

**School:** Volgenau School of Engineering

**Department:** Electrical and Computer Engineering

This certificate provides a broad understanding of the technologies, applications, and systems used in all forms of wireless communications.

The graduate certificate may be pursued on a part-time or full-time basis.

**Certificate Requirements**

Students must complete the following, for a total of 15 credits:
Core Courses

Choose 9 credits from the following:

- TCOM 516 - Global Positioning System (GPS) Credits: 1.5
- TCOM 526 - Advanced Global Positioning System (GPS) Credits: 1.5
- TCOM 551 - Digital Communication Systems Credits: 3
- TCOM 552 - Introduction to Mobile Communications Systems Credits: 3
- TCOM 606 - Advanced Mobile Communications Systems Credits: 3
- TCOM 607 - Satellite Communications Credits: 3
- TCOM 707 - Advanced Link Design Credits: 3

Elective Courses

- Six credits are required. Students may earn the credits from the Telecommunications MS emphasis areas 1, 2, and 3, including those in the mandatory course list that are not part of the 9 credits of core courses for the certificate.

Total: 15 credits

Doctoral Degree

Electrical and Computer Engineering, PhD

Banner Code: VS-PHD-ECE

School: Volgenau School of Engineering

Department: Electrical and Computer Engineering

The PhD program in Electrical and Computer Engineering educates students to do original research on ECE topics and to become technical leaders in their fields. It has a strong and growing reputation, as graduates from the department have become professors at other universities and researchers in various industrial and government research centers. Students may choose a research emphasis in areas such as communications, networking, computer engineering, control and robotics, signal processing, micro/nano-electronics, and bioengineering. The ECE PhD program requires course work, a qualifying exam, a teaching assignment, a dissertation proposal and research competency exam, a research seminar, dissertation research, and a dissertation defense. Mason’s general doctoral requirements apply to this program.

Admission Requirements

All general Mason and specific Volgenau School admission requirements apply. Applicants must submit official transcripts, a resume, a goals statement, three letters of recommendation and official GRE General Test results. The GRE requirement is waived for GMU ECE master's graduates with a 3.0 or
greater GPA. Applicants whose native language is not English must demonstrate proficiency by taking
the TOEFL or IELTS exam. The minimum score required for admission is 575 on the TOEFL paper-
based exam, 230 on the TOEFL computer-based exam, 88 on the TOEFL internet-based exam (with a
minimum of 20 in each section), or 6.5 on the IELTS exam. Application materials are reviewed by the
ECE PhD committee, which makes a recommendation to the ECE department chair.

Reduction of Credit

Students must complete a minimum of 72 graduate credits, which may be reduced by a maximum of
30 credits from a completed master’s degree. Reduction of credit requires the approval of the program
director or designee and the dean or designee of the school. They determine whether the credits are
eligible for reduction of credit and applicable to the degree program and the number of credits to be
reduced.

Degree Requirements

The 72 hours of required doctoral-level credits typically consist of 48 credits of regular coursework and 24 credits of dissertation
research. More than half of the 72 credits applied to the doctoral degree must be earned at Mason. The following degree plan is
based on a student who receives a full 30 credit reduction. Students who do not receive a full credit reduction should choose
additional credits in consultation with their advisor.

Doctoral Course Work (18-30 credits)

Courses that constitute a student’s plan of study will be chosen in consultation with the student’s advisor and/or dissertation
committee, to include:

- 3 credits at the 600-level outside the department in a subject considered foundational for the area of emphasis.
  Typical examples are advanced mathematics or statistics courses for those pursuing an emphasis in communications,
  signal processing or control, physics courses for those desiring an emphasis in micro/nano-electronics, computer
  science courses for those pursuing the computer engineering emphasis, and biology courses for those pursuing a
  bioengineering emphasis. Because such courses are usually not taken for master’s degrees, this requirement can rarely
  be satisfied with a course taken previously.
- 6 credits within the department but outside the area of emphasis.
  This requirement may be satisfied with courses taken during previous studies, subject to approval.
- A maximum of 6 credits may be at the 500-level*
- A maximum of 6 credits of individualized reading courses at any level.
  Note that ECE 798 Research Project is primarily a master’s level course and is not intended to be part of the PhD
  course work.

*For courses taken elsewhere, the equivalent levels are to be determined by the PhD advisor, subject to approval by the ECE
Department chair.

Qualifying Exam

The ECE PhD Qualifying Exam tests students’ knowledge of fundamental concepts and assesses their basic research skills. The
exam consists of two parts: a written technical qualifying exam and a research qualifying exam requiring a written report and a
presentation.

Technical Qualifying Exam
The Technical Qualifying Exam (TQE) is an in-class written exam that tests knowledge of fundamental concepts in a particular technical area. Students select one of three topics for their TQE:

1. Topic 1: Signals and Systems
2. Topic 2: Digital Design and Computer Organization
3. Topic 3: Circuits, Electronics, and Devices

Students must take the Technical Qualifying Exam within the first year after they have entered the program. The TQE is typically offered in late August, prior to the start of the fall semester. Students who enter the PhD program in the spring semester may request to take the TQE in January; such a request must be filed by the end of the spring semester.

Research Qualifying Exam

The purpose of the Research Qualifying Exam (RQE) is to assess whether students can define a research problem, critically review the literature related to the problem, apply appropriate research methods to study the problem, and interpret and communicate their results. The RQE requires students to complete a short research project and to document their results in a written report and an oral presentation. The RQE topic is defined by a faculty advisor in consultation with the student. A committee of three faculty members (the advisor plus two additional members) evaluates the written report and the oral presentation. During the presentation the student is expected to answer questions about their project and about fundamental concepts related to the research.

Students who enter the program with an MS degree must take the RQE prior to completing 12 credits in the PhD program. Students who enter the program with a BS degree must take the exam prior to completing 30 credits in the program.

Evaluation

After a student has taken both the TQE and the RQE, the ECE PhD Committee reviews the exam results, the student’s transcript, and a letter of recommendation from the student’s advisor. Based on this information, the PhD Committee determines whether the student is qualified for the PhD program. If the student does not qualify on their first try, they may repeat one or both of the exams in the following year. The TQE and RQE may be repeated once. A student who fails to qualify on their second try is removed from the program.

Dissertation Research (12-24 credits)

A maximum of 24 credits of ECE 998 and ECE 999 may be applied to the degree. Students who choose to take fewer than 24 credits of ECE 998 and ECE 999 may earn the remaining credits from approved course work. Students cannot enroll in ECE 999 before they have advanced to candidacy. Students advanced to candidacy after the add period for a given semester must wait until the following semester to register for ECE 999. Students cannot advance to candidacy and defend their dissertation during the same semester. Once enrolled in ECE 999, students must maintain continuous registration in ECE 999 each semester until graduation, excluding summers. Students who defend in the summer must be registered for at least 1 credit of ECE 999 during that summer term.

- ECE 998 - Doctoral Dissertation Proposal Credits: 1-12 (must complete a minimum of 9 credits)
- ECE 999 - Doctoral Dissertation Credits: 1-12 (must complete a minimum of 3 credits)

Advisor and Dissertation Director

Upon admission to the program, each student is assigned an ECE faculty member as advisor. When the student passes the qualifying exam, the dissertation director becomes the student’s advisor. A dissertation committee should be formed within a year after the student has passed the qualifying exam. The committee is headed by the dissertation director and includes two more graduate faculty members from ECE department and one from outside the department. One more member, from outside the
university, may be added to the dissertation committee if justified by the subject of the dissertation. All decisions concerning the student’s course requirements and dissertation committee must be approved by the PhD advisor and the ECE department chair.

**Dissertation Proposal, Research Competency Exam, Advancement to Candidacy**

The student prepares a written dissertation proposal outlining the proposed research and submits it to the dissertation committee for approval. After completing coursework requirements and preparing a proposal, the student takes a research competency exam to demonstrate their preparation for dissertation research. The exam consists of a presentation of the dissertation proposal followed by an oral exam. The exam is administered by the student's dissertation committee. The purpose of the oral exam is to verify that the student is familiar with the relevant material related to their research. The student is advanced to candidacy when he or she passes the oral exam and the dissertation committee approves the proposal.

**Dissertation Research and Defense**

Students conduct dissertation research under the guidance of their dissertation director, with regular consultation with other members of the dissertation committee. During this period, students must present their research results at least once in the form of a department seminar. The dissertation must represent an achievement in research, must be a significant contribution to its field, and should be deemed publishable in refereed journals or at highly selective conferences. On completion of the dissertation the student may be asked, at the discretion of the dissertation committee, to present a predefense in the presence of the committee members. The dissertation committee and the department chair approve the student’s application for a public defense of the doctoral dissertation. A copy of the dissertation must be placed in the University Libraries four weeks prior to the public defense. After a successful public defense and completion of the final form of the dissertation, the dissertation committee recommends the candidate for the degree of doctor of philosophy.

**Teaching Requirement**

To acquire teaching experience, each PhD student is required to participate in the department’s teaching activity. The requirement is typically satisfied by working as a recitation instructor for one semester, presenting several lectures within a course, or performing other teaching work approved by the department.

**Total: 72 credits**

**■ Interdisciplinary Programs (VS)**

*School: Volgenau School of Engineering*

The Volgenau School offers two interdisciplinary post-master programs: the PhD in Information Technology and the Engineer in IT degree. The first is designed for students who seek a doctoral program in Information Technology and want to be able to customize it to their needs. The second is a professional degree with the flexibility to integrate knowledge from all of the disciplines offered in our School. The programs are managed by the Graduate Student Services Office under the purview of the Senior Associate Dean.

Doctoral students may conduct their doctoral research under the supervision of any eligible faculty member of any of the school's departments. The doctoral program allows students to take a broad range of courses and research options. Students can specialize in various areas, including information systems, software engineering, and information security.
The Engineer in IT degree program allows a student to combine the advanced course work of the PhD degree in IT with an applied project. It is designed to meet the needs of working professionals seeking advanced and up-to-date training in IT areas, but who are not planning a research career.

In addition to these programs, the Volgenau School also participates in an interdisciplinary Executive Master of Science in Management of Secure Information Systems program, which is administered primarily through the School of Management (SOM) and taught jointly by faculty from the Volgenau School of Engineering, the School of Management, and the School of Public Policy. Because modern computerized information systems have become increasingly complex and ever more vulnerable to cyber attacks, a significant number of government regulations have been enacted. As a consequence, those responsible for the safe, secure, and efficient operation of such systems need to understand their technical aspects, need to be familiar with the principles of management, as well as have an understanding of the public policy impacts of regulatory and organizational decisions. This unique program prepares professionals to meet these challenges.

Master's Degree

Management of Secure Information Systems, MS (VSE)

Banner Code: BU-MS-MSIS

Phone: 703-993-1880
Email: cyber@gmu.edu

The Executive Management of Secure Information Systems MS, an interdisciplinary program offered by the Volgenau School of Engineering, the School of Management, and the School of Public Policy; prepares professionals for the challenges of modern computerized information systems that have become increasingly complex and vulnerable to cyber attacks, resulting in a significant number of government regulations. Consequently, those responsible for the safe, secure, and efficient operation of such systems need to grasp their technical aspects and be familiar with both the principles of management and the public policy impact of regulatory and organizational decisions.

The program is run as a cohort with no electives. The entire program has a duration of 16 months including about seven days of study abroad, which is included in the tuition. Applicants to the program are expected to have at least three years of full-time relevant work experience.

Admission Requirements

Applicant requirements include:

- Application form and application fee.
- A bachelor’s degree from a recognized university or an approved institution, recognized qualifications equivalent to a degree.
- Official copy of transcripts of all colleges and universities attended in the United States and abroad.
- Two professional letters of recommendation.
- Goals statement (statement of how and why applicants would benefit from the program).
- A current résumé.
- English proficiency standards as required of all Mason graduate students. In particular, applicants who have earned a bachelor's, master's, or doctoral degree from a regionally accredited university in the United States, Canada (excluding province of Quebec), United Kingdom, Ireland, Australia, and New Zealand are considered to have met that standard. All other applicants are required to take an English proficiency examination and meet minimum scores set by Mason in
order to be considered for admission. The TOEFL or IELTS exams can be used to meet this requirement. The minimum scores are: TOEFL: IBT (88 total with 20 points minimum in each section); CBT (230); and PBT (570); IELTS – Academic: 6.5 total band score.

- GMAT (recommended score: the mean GMAT scores of an entering class should meet or exceed 550 with an individual minimum of 500) or GRE (recommended score: 1200). The GMAT or GRE may be waived if the applicant’s record demonstrates the ability to succeed in a competitive and quantitative program.
- A minimum of three years of significant full-time work experience is required. Successful applicants generally have between three and five years of professional experience.

**MS-MSIS Degree Requirements**

Students are responsible for familiarization and compliance with the Academic Policies in this catalog.

**Required Courses (36 credits)**

- MSEC 510 - Foundations of Cyber Security Credits: 2
- MSEC 511 - Security Practices in the Enterprise Credits: 2
- MSEC 520 - Networking Principles Credits: 1
- MSEC 620 - Networking Security Credits: 2
- MSEC 630 - Secure Information System Governance, Regulation, and Compliance Credits: 2
- MSEC 640 - Privacy and Ethics in an Interconnected World Credits: 2
- MSEC 641 - Enterprise Security Threats Credits: 1
- MSEC 642 - Enterprise Security Technologies Credits: 2
- MSEC 650 - Seminar: Enterprise Security Case Studies Credits: 1
- PUBP 610 - Organizations, Management, and Work: Theory and Practice Credits: 2
- PUBP 611 - Critical Infrastructure Protection in Theory, Policy and Practice Credits: 2
- TECM 610 - Communications and Leadership Credits: 2
- TECM 615 - Decision Making Using Accounting and Financial Data Credits: 3
- TECM 620 - Economics of Technology Management Credits: 2-3
- TECM 640 - Management of Consulting and Technical Professionals Credits: 1-3
- TECM 703 - Technology Assessment, Evaluation, and Investment Credits: 3
- TECM 735 - Technology Management Capstone Project Credits: 2 or MSEC 720 - Capstone Project in Management of Secure Information Systems Credits: 1-3
- TECM 750 - Global IT Management Credits: 2-4 or MSEC 710 - Global Residency Credits: 1-4

**Professional Degree**

**Information Technology Engineer Degree**

**Banner Code: VS-ENGR-INFT**

**School: Volgenau School of Engineering**

**Department: Interdisciplinary Programs**
The engineer degree is a post-master’s degree but does not confer a doctorate. Students in the engineer degree can take advanced PhD courses and complete a project of an applied nature to fulfill program requirements.

**Admission Requirements**

Admission requirements for the engineer degree are the same as for the PhD in information technology.

**Plan of Study**

The program is made up of specialized course work followed by completion of an applied project summarized in a project report. Under the guidance of the supervisory committee, students prepare a tentative plan of study. The plan lists the intended courses and their expected timing. The plan should also contain a tentative subject for the applied project.

**Specialized Course Work**

Students must include in the plan of study a well-defined advanced concentration area. Successful completion of this requirement should enable students to conduct applied research in a significant contemporary area in IT.

The supervisory committee and The Volgenau School Senior Associate Dean must approve a plan of study. These approvals must occur before a student completes the courses in the area of concentration. There is no guarantee that a course taken before this approval will be accepted. Students must take 30 credits of graduate-level course work. A GPA of 3.50 is required in these credits.

The plan of study may include at most 3 credits of directed reading course work. At least 12 credits must be in courses numbered 700 or higher, and these 12 credits cannot include directed reading, a project, or thesis courses.

Courses that cannot be included in any plan of study are INFS 500-level courses; AIT 500 or 600-level courses; OR/SYST 540; and SYST 500. The Senior Associate Dean must approve exceptions to any of these rules in advance.

**Supervisory Committee**

On admission to the program, students are assigned a temporary advisor. Students are responsible for working with the temporary advisor until they select a project director and a supervisory committee. It is recommended that a student form a supervisory committee as soon as feasible. The supervisory committee includes the project director plus at least two additional members. The committee must contain at least two graduate faculty members from The Volgenau School. It is strongly recommended that the committee include at least one person from outside the university who is knowledgeable in the subject area of the project. The supervisory committee supervises the project proposal presentation and the project defense.

**Project Proposal Presentation**

Near the end of the course work, each student prepares a written project proposal, which is presented to the supervisory committee. Students may enroll in IT 996 Engineer Project Proposal to complete this effort. During the term students expect to present the project proposal to the committee, they should enroll in IT 991 Engineer Project Presentations. After successfully completing this requirement, students are formally admitted as candidates for the engineer degree. The application for candidacy is submitted to the office of the Senior Associate Dean on a standard form.

**Project and Final Defense**
With the concurrence of the supervisory committee, students proceed with the project research, during which time they must continuously enroll in IT 997 Engineer Project. Students must complete a minimum of 12 credits from among IT 991, 996, and 997, with a minimum of 6 credits of IT 997. When the central portions of the project work have been completed to the point that students are able to describe the contributions of the project effort, they submit the written project report to the supervisory committee. Once the committee believes the student is ready, a final public oral defense may be scheduled; the application for the defense must be submitted to the Senior Associate Dean at least one month in advance of the defense so that the announcement is posted for at least two weeks.

Following a satisfactory evaluation of the oral defense of the project by the supervisory committee, the student must submit, with supervision from the project director, a final project that represents a definitive contribution to applied knowledge in IT. This document must be compliant with the university's regulations for appearance and must be submitted to the library. If the candidate successfully defends the project, the supervisory committee recommends that the final form of the project be completed and Volgenau School faculty and the graduate faculty of Mason recommend the candidate for graduation.

**Applying and Completing a PhD Program**

Students who are awarded an engineer degree have the option of applying to one of our PhD programs. Candidates must satisfy all applicable university requirements and all requirements established by the doctoral program faculty. Doctoral candidates must earn a minimum of 72 graduate credits, which may be reduced by a maximum of 30 credits from a related master's degree or engineer degree.

**Total: 42 credits**

**Doctoral Degree**

**Information Technology, PhD**

*Banner Code: VS-PHD-INFT*

*School: Volgenau School of Engineering*

*Department: Interdisciplinary Programs*

When the term “information technology” is used at Mason to describe the IT doctoral program, it is intended to mean information technology and the branches of engineering most closely associated with information use and management. These aspects of technology are emphasized in this geographic region, and the relevance of the IT doctoral program has grown with the increasing dependence of the nation’s commerce on the effective use of information. Our focus on the science and technology of information processing complements and enhances the more traditional approaches to engineering that are more strongly based on the physical and material sciences.

The general doctoral requirements of Mason apply to this program.

**Admission Requirements**

Students are selected on the basis of scholarship and potential from among applicants with appropriate degrees from institutions of high standing.
Generally, a Master’s degree in an information technology-related area, such as engineering, computer science, operations research, mathematics, and physical sciences is required for admission to the doctoral program. However, in some instances, well-qualified students without a clearly related Master’s degree (i.e., MS in Information Technology Management, MBA) may be offered admission.

An undergraduate GPA of 3.00 and a graduate GPA of 3.50 are basic requirements for applicants. The admission process involves submitting the following materials: application for admission, undergraduate and graduate transcripts from previous colleges and universities attended, GRE test results, three letters of reference, a résumé, a personal goal statement, and a self-evaluation form to identify research areas of interest. Foreign transcripts must be translated and evaluated (course-by-course preferred) by a member of the NACES Membership. Evaluations can be also be done by George Mason University, at no extra cost to the applicant; however, this typically adds 6-8 weeks to the application processing time. Please review George Mason University’s Policy on International Transcript Submission. An applicant’s entire background is examined before an admission decision is made.

Students who wish to be considered for Mason’s Presidential Scholarship, which provides a stipend and tuition support for three years, must submit GRE scores with a score of at least 1,200 or the equivalent score with their application. One Presidential Scholarship is awarded per PhD program per year. To ensure a common ground of fundamentals, students should have a background in such topics as calculus, differential equations, linear algebra, discrete structures, probability, and statistics. In addition, students entering the PhD in Information Technology Program must have a sound working knowledge in computing as demonstrated by examples of programs or applications developed and tested in at least one high level programming language environment. Because much of the coursework within this program requires computational proficiency, experience with a variety of languages and computer hardware is useful as is an understanding of computer architecture. Highly-qualified students who do not present evidence of appropriate coursework may be admitted and then required to take appropriate articulation courses.

**Reduction of Credit**

Students must complete a minimum of 72 graduate credits, which may be reduced by a maximum of 30 credits from a completed Master's degree. Reduction of credit requires the approval of the program director or designee and the dean or designee of the school. They determine whether the credits are eligible for reduction of credit and applicable to the degree program and the number of credits to be reduced.

**Degree Requirements**

Information Technology doctoral candidates must earn a minimum of 72 graduate credits. The program is made up of a breadth requirement (assessed via qualifying exams) and specialized coursework (assessed via the comprehensive exam), followed by preparation of a dissertation proposal and final defense. In order to advance to candidacy, students must complete all coursework, pass the qualifying and comprehensive examinations, and defend a dissertation proposal.

The following degree plan is based on a student who receives a full 30 credit reduction. Students who do not receive a full credit reduction should choose additional credits in consultation with their advisor.

**Doctoral Coursework/Plan of Study (18 credits)**

Students must include in the plan of study a well-defined set of advanced courses in a focused area. Successful completion of this requirement should enable the student to do basic or applied research in a significant contemporary area in IT.

The 18 credits of graduate-level coursework must fulfill the following requirements:

- Coursework must be independent of the courses students take to prepare for the qualifying exams. That is, if a student takes a qualifying exam related to OR 541, then OR 541 cannot be counted as 3 credits of coursework.
• Courses that cannot be included in any plan of study are any INFS 500-level courses; any AIT courses; OR 540; STAT 501, STAT 502, STAT 503, STAT 535; and SYST 500. Exceptions must be approved in advance by the senior associate dean.
• At least 12 of the 18 credits must be in courses numbered 700 or higher, and these 12 credits cannot include directed reading, project, or thesis courses.
• A cumulative GPA of 3.50 is required in courses taken in the plan of study.

Concentrations (18-24 credits)

In lieu of creating a personalized plan of study (above), students have the option of selecting a concentration area in information systems, information security and assurance, or software engineering; however, it is not a requirement, as it narrows program flexibility. In some instances, a concentration may be inappropriate for students conducting interdisciplinary research. Students who declare a concentration will have the concentration noted on their transcript. Students seeking a concentration must satisfy all requirements for the PhD in information technology.

Courses required for each concentration are in addition to courses taken to prepare for the Qualifying Exam.

▲Concentration in Information Security and Assurance (ISA)

Students must take at least 24 credit hours, with at least 18 credits as follows:

Note: Students with a credit reduction may need fewer hours to fulfill the concentration requirements

• ISA 862 - Models for Computer Security Credits: 3
• 3 credits from 600 level or higher ISA courses
and at least four courses (12 credits) from the following:
• ISA 640 - Programming Language Security Credits: 3
• ISA 650 - Security Policy Credits: 3
• ISA 652 - Security Audit and Compliance Testing Credits: 3
• ISA 656 - Network Security Credits: 3
• ISA 673 - Operating Systems Security Credits: 3
• ISA 674 - Intrusion Detection Credits: 3
• ISA 681 - Secure Software Design Credits: 3
• ISA 685 - Emerging Topics in Cyber Security Credits: 3
• ISA 697 - Topics in Information Security Credits: 1-6
• ISA 763 - Security Protocol Analysis Credits: 3
• ISA 764 - Security Experimentation Credits: 3
• ISA 765 - Database and Distributed Systems Security Credits: 3
• ISA 767 - Secure Electronic Commerce Credits: 3
• ISA 796 - Directed Readings in Information Security Credits: 3
• ISA 863 - Advanced Topics in Computer Security Credits: 3
• SWE 781 - Secure Software Design and Programming Credits: 3
• INFS 865 - Networks and Distributed Systems Security Credits: 3
Note: Students without a credit reduction should select the remaining 6 elective credits from 600 level or higher ISA courses or courses approved in advance by the student's academic advisor

▲Concentration in Information Systems (ISYS)
Students must take at least 24 credit hours, with at least 18 credits as follows:

- 12 credits from Group A: INFS and ISA courses in Information Systems and Information Security
- The remaining 6 credits from Groups B and C: SWE and CS courses in Software Engineering and Computer Science

Note: Students with a credit reduction may need fewer hours to fulfill the concentration requirements

Group A:
- INFS 764 - Object-Oriented Database Systems Credits: 3
- INFS 796 - Directed Readings in Information Technology Credits: 3
- INFS 861 - Distributed Database Management Systems Credits: 3
- INFS 865 - Networks and Distributed Systems Security Credits: 3
- INFS 867 - Intelligent Databases Credits: 3
- ISA 562 - Information Security Theory and Practice Credits: 3
- ISA 656 - Network Security Credits: 3
- ISA 765 - Database and Distributed Systems Security Credits: 3
- ISA 797 - Advanced Topics in Information Security Credits: 3

Group B:
- SWE 720 - Advanced Software Requirements Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 763 - Software Engineering Experimentation Credits: 3
- SWE 796 - Directed Readings in Software Engineering Credits: 3
- SWE 821 - Software Engineering Seminar Credits: 3
- SWE 823 - Software for Critical Systems Credits: 3
- SWE 824 - Program Analysis for Software Testing Credits: 3

Group C:
- CS 583 - Analysis of Algorithms Credits: 3
- CS 688 - Pattern Recognition Credits: 3
- CS 719 - Scaling Technologies for E-business Credits: 3
- CS 782 - Machine Learning Credits: 3
- CS 787 - Decision Guidance Systems Credits: 3
- CS 880 - Research Topics in Artificial Intelligence Credits: 3
- CS 811 - Research Topics in Machine Learning and Inference Credits: 3

Note: Students without a credit reduction should select the remaining 6 elective credits from any 600 level or higher INFS, ISA, CS or SWE courses or courses approved in advance by the student's academic advisor

▲Concentration in Software Engineering (SWE)

Students must take at least 24 credit hours as follows:

Note: Students with a credit reduction may need fewer hours to fulfill the concentration requirements

- SWE 763 - Software Engineering Experimentation Credits: 3 or CS 700 - Quantitative Methods and Experimental Design in Computer Science Credits: 3
  12 credits from SWE 700-level courses:
- SWE 720 - Advanced Software Requirements Credits: 3
- SWE 721 - Reusable Software Architectures Credits: 3
- SWE 723 - Precise Modeling Credits: 3
- SWE 727 - Quality of Service for Software Architectures Credits: 3
- SWE 781 - Secure Software Design and Programming Credits: 3
• SWE 795 - Advanced Topics in Software Engineering Credits: 3
• SWE 796 - Directed Readings in Software Engineering Credits: 3
• SWE 798 - Research Project Credits: 3

9 credits from the following:
• SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
• SWE 620 - Software Requirements Analysis and Specification Credits: 3
• SWE 621 - Software Modeling and Architectural Design Credits: 3
• SWE 622 - Distributed Software Engineering Credits: 3
• SWE 623 - Formal Methods and Models in Software Engineering Credits: 3
• SWE 625 - Software Project Management Credits: 3
• SWE 626 - Software Project Laboratory Credits: 3
• SWE 630 - Software Engineering Economics Credits: 3
• SWE 631 - Object-Oriented Design Patterns Credits: 3
• SWE 632 - User Interface Design and Development Credits: 3
• SWE 637 - Software Testing Credits: 3
• SWE 641 - Systems Architecture for Large-Scale Systems Credits: 3
• SWE 642 - Software Engineering for the World Wide Web Credits: 3
• SWE 645 - Component-Based Software Development Credits: 3
• SWE 699 - Special Topics in Software Engineering Credits: 3
• SWE 823 - Software for Critical Systems Credits: 3
• SWE 824 - Program Analysis for Software Testing Credits: 3
• SWE 825 - Special Topics in Web-Based Software Credits: 3
• SWE 860 - Software Analysis and Design of Real-Time Systems Credits: 3
• CS 706 - Concurrent Software Systems Credits: 3
• INFS 740 - Database Programming for the World Wide Web Credits: 3
• INFS 750 - Application Frameworks for Windowed Information Systems Credits: 3
• INFS 755 - Data Mining Credits: 3
• INFS 760 - Advanced Database Management Credits: 3
• INFS 764 - Object-Oriented Database Systems Credits: 3
• INFS 770 - Knowledge Management for E-Business Credits: 3
• INFS 790 - Information Systems Policy and Administration Credits: 3
• INFS 796 - Directed Readings in Information Technology Credits: 3
• INFS 797 - Advanced Topics in Information Systems Credits: 1-6
• INFS 798 - Research Project Credits: 3
• INFS 861 - Distributed Database Management Systems Credits: 3
• INFS 865 - Networks and Distributed Systems Security Credits: 3
• INFS 867 - Intelligent Databases Credits: 3
• ISA 562 - Information Security Theory and Practice Credits: 3
• ISA 656 - Network Security Credits: 3
• ISA 765 - Database and Distributed Systems Security Credits: 3
• ISA 767 - Secure Electronic Commerce Credits: 3
• ISA 862 - Models for Computer Security Credits: 3

Note: Students can take both CS 700 and SWE 763.

Qualifying Exams
To satisfy the breadth requirement of the PhD degree, students must pass a set of written qualifying exams designed to test fundamental knowledge. Generally, students have already obtained a Master’s degree in a field appropriate to IT, which prepares them for the qualifying exams. These exams correspond to a set of disciplines related to the individual Master’s programs in the Volgenau School. Each exam is based on a reading list posted on the school’s web site. The qualifying exams are not associated with specific courses, although some courses may help students prepare for these exams. The qualifying exams are offered twice a year at specified locations on campus, typically near the beginning of the fall and the spring semesters. Each exam is allocated two hours. The exams are graded on a pass or fail basis.

Students must indicate which exams are being requested through an appropriate form signed by the student and submitted to the office of the senior associate dean.

Each student must pass a set of four different exams in two consecutive offerings of the exams. Four exams must be attempted in the first offering. Thus, the following passing scenarios are allowed: (1) pass all four on the first attempt, (2) pass three in the first attempt and one in the next, (3) pass two in the first attempt and two in the next, (4) pass one in the first attempt and three on the second, and (5) pass all four on the second attempt. The exams attempted on the second offering need not be the same as in the first. A student who fails to pass the qualifying exams under any of these scenarios is subject to termination from the program.

Students must take the qualifying exams within two years of enrolling in the program; otherwise, the exams must be taken no later than the first opportunity after completion of their coursework. If a student enters the program without a Master’s degree, these time limits are measured from the date when the student completes the equivalent of an appropriate Mason Master’s degree.

Dissertation Research (24 credits)

Choose 24 credits from the following:

- IT 990 - Dissertation Topic Presentation Credits: 1
- IT 998 - Doctoral Dissertation Proposal Credits: 1-12
- IT 999 - Doctoral Dissertation Credits: 1-12 (must complete a minimum of 12 credits)

Doctoral Supervisory Committee

On admission to the program, students are assigned a temporary academic advisor. Students are responsible for working with the temporary advisor until they choose a dissertation director and establish a doctoral supervisory committee.

The doctoral supervisory committee includes the dissertation director, who must be a member of the Mason graduate faculty, and at least three other people from the Mason graduate faculty. The dissertation director and chair of a PhD in IT dissertation committee must have at least a 50% appointment in the Volgenau School. This rule does not apply to a co-director, provided that the chair and other co-director satisfies the "at least 50% rule." At least three committee members must be from the Volgenau School, and at least two of the departments of the Volgenau School must be represented on this committee.

In addition, industrial representatives and faculty members from departments outside the school are highly desirable, but not required, on the committee. The doctoral supervisory committee administers the comprehensive exam, dissertation proposal presentation, and the dissertation predefense and defense. Permission for the comprehensive exam and dissertation defense are requested from the Volgenau School senior associate dean on the basis of a written request and plan that has been approved by the supervisory committee.

Comprehensive Exam

The comprehensive exam is an oral exam taken after students have satisfactorily completed all coursework requirements in their approved plan of study. To initiate the exam process, the student meets with the dissertation advisor to prepare a permission form, which has to be approved by the entire dissertation supervisory committee, to be forwarded to the senior associate dean for final approval. The exam committee consists of the doctoral supervisory committee plus any outside examiners considered...
appropriate. The permission form should contain the following items: a) a one page description of the intended area of research; and b) a reading list on which the student will be examined. The reading list should include articles and/or books that cover the fundamentals, state-of-the-art, and tools needed to perform research in the intended area. This exam is to be taken at a designated place on campus.

The objective of the comprehensive exam is to allow the dissertation supervisory committee to assess the student’s readiness to complete doctoral research in an area of concentration. The result of the comprehensive exam is a grade of pass or fail with recommendations for removing any deficiencies. Students must pass the comprehensive exam and dissertation proposal defense before being advanced to candidacy. The comprehensive exam must be attempted for the first time no later than one year after completing all coursework requirements.

Students who fail the comprehensive exam may request a re-exam within 60 days of receiving notice of the exam result. The request should be made in writing to the senior associate dean. A student may request a new exam in a different format if the intended area of research has changed, but the request must comply with the rules specified above. If the student fails again or does not request a re-exam within 60 days, the student will be terminated from the PhD program. Appeals on any of the two attempts must be submitted in writing to the senior associate dean within 15 days of the date the decision was communicated to the student.

**Dissertation Proposal Presentation**

Near the end of the coursework, doctoral students prepare a written dissertation proposal which is presented to the doctoral supervisory committee. Students may enroll in IT 998 Doctoral Dissertation Proposal to complete this effort. During the term the student expects to present the dissertation proposal to the committee, the student should enroll in IT 990 Dissertation Topic Presentations. After successfully completing this requirement, the student is formally admitted as a candidate for the PhD degree. The application for candidacy is submitted to the senior associate dean on a standard form.

**Dissertation and Final Defense**

With the concurrence of the dissertation supervisory committee, students proceed with the doctoral research, during which time they must be continuously enrolled in IT 999 Doctoral Dissertation. When the central portions of the research have been completed to the point that students are able to describe the original contributions of the dissertation effort, they submit the written dissertation to the committee and schedule an oral predefense to the committee. The predefense is to be held no sooner than one month after members of the committee have copies of the dissertation. Once the committee believes the student is ready, a final public oral defense may be scheduled no sooner than one month after the conclusion of the predefense so that the announcement is posted for at least two weeks. The entire dissertation committee must be present at the defense, unless an exception is approved by the senior associate dean in advance of the defense.

Following satisfactory evaluation of the oral defense of the dissertation by the committee, the student must prepare, with supervision from the dissertation director, a final publishable dissertation that represents a definitive contribution to knowledge in IT. This document must meet format guidelines specified by the *Guide for Preparing Graduate Theses, Dissertations, and Projects*. If the candidate successfully defends the dissertation, the dissertation committee recommends that the final form of the dissertation be completed and the Volgenau School faculty and the graduate faculty of Mason accept the candidate for the PhD degree.

If the student fails to successfully defend the dissertation, the student may request a second defense, following the same procedures as for the initial defense. There is no time limit for this request other than general time limits for the doctoral degree. An additional predefense is not required, but students are strongly advised to consult with the committee before scheduling a second defense. If the student fails on the second attempt to defend the dissertation, the student will be terminated from the program.

**Total: 72 credits**
Statistics

Phone: 703-993-3645
Web: statistics.gmu.edu

School: Volgenau School of Engineering

Faculty

Professors: Carr, Gentle, Hughes-Oliver, Rosenberger (chair), Wegman

Associate professors: Davis (associate chair), Miller, C. Sutton, Vidyashankar

Assistant professors: Diao, Tang

Instructors: Izmirli, Sims, Strazzeri, Surina

Emeritus faculty: Bolstein

Course Work

The Statistics Department offers all courses designated STAT in the Courses chapter of this catalog. Statistical methods and methods for data analysis are crucial for researching and exploring the life sciences, natural sciences, social sciences, business, nursing, education, and engineering. The Statistics Department offers a variety of introductory courses and more advanced course work in specialized statistical methodology and applications. The focus of the department’s offerings is applied, with special emphasis on biostatistics, graphics and visualization, federal and survey statistics, and engineering applications of statistics and data analysis.

Introductory courses are targeted for undergraduates in the College of Humanities and Social Sciences and the College of Health and Human Services, as well as in the Volgenau School. The STAT 250–350 sequence is targeted for general audiences, while the STAT 344–354 sequence is targeted for technical and scientific audiences. STAT 362 deals with computer statistical packages and is appropriate as a second or third course for students from a wide variety of backgrounds. It is strongly recommended for students who elect to minor in data analysis.

Although the department does not offer an undergraduate degree in statistics, it does offer a minor in data analysis. Also, a variety of advanced undergraduate courses are available for inclusion in other degree programs.

Undergraduate Minor

Data Analysis Minor

Banner Code: DATA

School: Volgenau School of Engineering

Department: Statistics
The minor provides students with a background in data analysis and statistical methodology. It is intended to complement undergraduate degree programs in the Volgenau School and the College of Science, especially computer science, economics, environmental engineering, geography, mathematics, nursing, psychology, public administration, sociology, and systems engineering.

Course Requirements

The minor requires 15 credits: a core sequence of 6 credits, plus 9 credits of electives. Grades of C or better are required in all courses. At least 9 of the 15 credits must be in STAT courses. At least 8 credits must be in courses not required by the student’s major.

Core Sequence (6 credits)

To satisfy the core requirement, students must complete one of these sequences.

- STAT 250 - Introductory Statistics I Credits: 3
- STAT 350 - Introductory Statistics II Credits: 3
- OR
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3
- OR Provided the 9 elective credits are all STAT courses, mathematics majors may substitute:
- MATH 351 - Probability Credits: 3
- MATH 352 - Statistics Credits: 3

Elective Courses (9 credits)

The 9 elective credits must be chosen from a list of courses approved by the department's undergraduate coordinator. Courses currently approved for the minor are the following:

- STAT 362 - Introduction to Computer Statistical Packages Credits: 3
- STAT 435 - Analysis of Experimental Data Using SPSS Credits: 3
- STAT 455 - Experimental Design Credits: 3
- STAT 457 - Applied Nonparametric Statistics Credits: 3
- STAT 463 - Introduction to Exploratory Data Analysis Credits: 3
- STAT 474 - Introduction to Survey Sampling Credits: 3
- STAT 499 - Special Topics in Statistics Credits: 3
- BINF 401 - Bioinformatics and Computational Biology I Credits: 3
- CDS 401 - Scientific Data Mining Credits: 3
- CEIE 410 - Geographic Information Systems in Engineering Credits: 3
- CS 450 - Database Concepts Credits: 3
- CS 484 - Data Mining Credits: 3
- ECON 345 - Introduction to Econometrics Credits: 3
- ECON 445 - Design and Analysis of Experiments Credits: 3
- GCH 460 - Program Evaluation Credits: 3
- GOVT 300 - Research Methods and Analysis Credits: 4
- GGS 300 - Quantitative Methods for Geographical Analysis Credits: 3
- GGS 354 - Data Analysis and Global Change Detection Techniques Credits: 3
- OR 335 - Discrete Systems Modeling and Simulation Credits: 3 (or crosslisted course SYST 335)
- OR 441 - Deterministic Operations Research Credits: 3
- OR 442 - Stochastic Operations Research Credits: 3
- PSYC 300 - Statistics in Psychology Credits: 4
- SOCI 313 - Statistics for the Behavioral Sciences Credits: 4
- SOCI 405 - Analysis of Social Data Credits: 4
- SYST 469 - Human Computer Interaction Credits: 3
- SYST 473 - Decision and Risk Analysis Credits: 3

Total: 15 credits

Bachelor's/Accelerated Master's Program

BS (selected)/Statistical Science, Accelerated MS

School: Volgenau School of Engineering

Department: Statistics

This degree option allows Mason students to earn an MS in statistical science in less time than if they had first graduated from a Volgenau School bachelor's program or the BS in Mathematics and then applied to the MS program.

Admission Requirements

Students must begin MS work within six months following completion of a BS degree in any one of the Volgenau School major areas or a BS in mathematics from the College of Science. Admission is guaranteed to any student with an overall GPA of 3.00 in courses taken after the first two undergraduate years (60 credits) with grades of B or better in the two 500-level STAT courses selected from STAT 544, 554, and 574.

Degree Requirements

The program consists of a minimum of 144 credits that satisfy the requirements for both the BS in the undergraduate major and the MS in statistical science with 6 credits of overlap. Twenty-four credits are required for the MS, provided that students have taken two of STAT 544, 554, and 574 as part of their BS course work.

Master's Degree

Statistical Science, MS

Banner Code: VS-MS-STAT

School: Volgenau School of Engineering
Statistical science is regarded as one of the oldest and most successful information technology (IT) subjects. It focuses on the conversion of raw data into information. In this graduate program, students are trained in the theory and practice of statistical methodology, particularly as it relates to high-technology applications.

**Admission Requirements**

In addition to satisfying general admission requirements for graduate study, all applicants are expected to have basic computer literacy. They also must hold a bachelor’s degree from an accredited institution in a field that includes coursework in multivariable calculus, matrix or linear algebra, statistics, and calculus-based probability. Applicants with degrees in such fields as mathematics, statistics, and some engineering programs usually meet these requirements. For applicants with degrees in other fields, these requirements are normally satisfied if students have successfully completed courses equivalent to the following Mason courses: MATH 113, 114, 213; MATH 203 or 321; STAT 250 or 344; and STAT 346 or MATH 351. Coursework taken to correct deficiencies in undergraduate preparation is not counted toward the degree.

**Degree Requirements**

In addition to meeting general requirements that apply to master’s degrees at Mason, all students must complete the 12-credit core requirements for the degree. Students build on these core requirements by choosing 12 credits of methodology courses and 6 credits of electives.

Students select either the professional or research option, depending on career ambitions. This choice must be made no later than the end of the semester in which 15 credits have been completed. The professional option provides MS degree qualifications to those seeking an expanded knowledge base in modern statistical theory and practice but do not wish to pursue a research career. The research option is for students planning to continue with a PhD degree, or begin/continue careers in statistical methodology research.

**Professional Option:**

The professional option focuses on completing coursework in modern statistical theory and practice. Thirty credits are required for the degree: 12 credits of core courses (taken by all MS students), 12 credits of methodology courses, and 6 credits of electives. Students electing this option are encouraged to pursue a broad background in statistical science, and they may seek to concentrate on applications of statistical methodology to other disciplines.

Students who select the professional option may elect to complete a master’s research project resulting in a technical report. This report is not an original research report but a scholarly essay on a topic of current interest in the statistical science discipline. The technical report is usually about 20 to 25 pages long and demonstrates the student’s ability to read and synthesize current technical literature into a scholarly essay. The report is evaluated by the student’s adviser, taking into account the comprehensiveness of the coverage of the scientific literature, the accuracy of presentation and interpretation, and the literary style. Students are notified of their evaluations, and they may be required to revise their report to further develop their skills in preparing reports on technical subjects. The report is usually written in the context of 3 credits of STAT 798 Master’s Research Project, which count as elective credits. Students opting not to complete a research project must take 30 credits of coursework.

**Research Option:**

The research option requires 30 credits, including 6 credits that must be in independent research (thesis). Research is done under the guidance of a faculty member. Research may be carried out at Mason or, if appropriate, at nearby facilities. For example, students may pursue research at their place of employment on topics of interest to their employer, provided the research meets the standards of the university. The thesis is usually written in the context of 6 credits of STAT 799 Master's Thesis, which count as elective credits. The remaining 24 credits include the 12 core credits and 12 methodology credits.
In addition to satisfying general university requirements for a master’s degree, candidates who select the research option must submit a thesis based on the research to the student’s thesis committee, which must give preliminary approval. The composition and appointment of this committee follows graduate program policies.

Candidates also must pass a final oral exam that concentrates on, but is not limited to, the area on which the thesis is written. The exam is administered by the student’s thesis committee, and all interested members of the graduate faculty are invited to attend and participate in the questioning. The thesis committee makes the final decision on whether the candidate passes or fails.

**Core Courses (12 credits)**

The core coursework covers the basic elements of statistics at the graduate level. STAT 544 covers the major mathematical framework for statistical theory and practice. STAT 652 provides basic statistical theory. After completing this course, students have the theoretical basis from which statistical methods are derived.

STAT 554 is a survey of statistical methods that have become the backbone of statistical practice. Focus in this course is on techniques that quantify random behavior. The final core course is STAT 656, which focuses on the theory and application of linear regression analysis.

- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 652 - Statistical Inference Credits: 3
- STAT 656 - Regression Analysis Credits: 3

**Methodology Courses (12 credits)**

Methodology courses may be chosen from any STAT courses numbered 540-775.

**Elective Courses (6 credits)**

Elective courses may be chosen from any STAT courses numbered 500-519, 540-799. Students opting to complete either a Master’s Research Project (STAT 798) or Master’s Thesis (STAT 799) must notify the department’s graduate coordinator in writing no later than the end of the semester in which 15 credits have been completed. Certain courses from other departments may be used as elective courses within a customized plan of study. A customized plan of study requires prior written approval by the department’s graduate coordinator; it must be submitted for approval no later than the end of the semester in which 15 credits have been completed and must include a written justification for the proposed plan. Any changes to a customized plan of study must be approved in writing.

**Total: 30 credits**

**Note:**

A student concurrently enrolled in the Certificate in Actuarial Sciences Program and the MS in Statistical Science Program may count MATH 555 and 556 as approved elective courses and may count MATH 653 and 654 as methodology courses when designing a curriculum for the MS in Statistical Science. Credit toward the MS in Statistical Science will not be given for both MATH 654 and STAT 668. The full curriculum should be designed with the approval of the student’s statistics academic advisor.
and the statistics graduate coordinator. The Certificate in Actuarial Sciences must be completed prior to or concurrently with the MS in Statistical Science. Otherwise, at most two of MATH 555, 556, 653, and 654 can be counted toward the MS in Statistical Science as elective courses; none can be applied as methodology courses.

Course Lists

Following are course lists by area of interest. Students do not have to select all of their courses from any one of these lists; they are provided only as a guide.

Applied Statistics:

- STAT 560 - Biostatistical Methods Credits: 3
- STAT 574 - Survey Sampling I Credits: 3
- STAT 655 - Analysis of Variance Credits: 3
- STAT 657 - Nonparametric Statistics Credits: 3
- STAT 662 - Multivariate Statistical Methods Credits: 3
- STAT 663 - Statistical Graphics and Data Exploration I Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3
- STAT 674 - Survey Sampling II Credits: 3

Biostatistics:

- STAT 560 - Biostatistical Methods Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3
- STAT 668 - Survival Analysis Credits: 3
- STAT 760 - Advanced Biostatistical Methods Credits: 3
- STAT 773 - Statistical Methods for Longitudinal Data Analysis Credits: 3

Computational Statistics:

- STAT 657 - Nonparametric Statistics Credits: 3
- STAT 663 - Statistical Graphics and Data Exploration I Credits: 3
- STAT 751 - Computational Statistics Credits: 3
- STAT 763 - Statistical Graphics and Data Exploration II Credits: 3

Engineering Statistics:

- STAT 645 - Stochastic Processes Credits: 3
- STAT 655 - Analysis of Variance Credits: 3
- STAT 658 - Time Series Analysis and Forecasting Credits: 3
- STAT 662 - Multivariate Statistical Methods Credits: 3
- STAT 719 - Computational Models of Probabilistic Reasoning Credits: 3
- STAT 758 - Advanced Time Series Analysis Credits: 3
Dual Master's

Mathematics and Statistical Science Dual-Degree MS (VS)

Banner Codes: SC-MS-MATH, VS-MS-STAT

Schools: Volgenau School of Engineering and College of Science

Department: Statistics and Mathematical Sciences

This program allows students to earn an MS degree in mathematics and an MS degree in statistical science by completing 48 credits of course work in both areas instead of the 60 that would be required if the degrees were sought independently.

Admission Requirements

Applicants must satisfy admission requirements for both the Mathematics, MS and the Statistical Science, MS programs. A joint faculty committee from the Mathematical Sciences and Statistics Departments make final admission decisions into the dual-degree program.

MS-MATH/STAT Dual-Degree Requirements

The dual-degree program requires a total of 48 credits as specified below:

- MATH 621 - Algebra I Credits: 3
- MATH 675 - Linear Analysis Credits: 3
- MATH 677 - Ordinary Differential Equations Credits: 3 or MATH 678 - Partial Differential Equations Credits: 3
- MATH 685 - Numerical Methods Credits: 3
- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 652 - Statistical Inference Credits: 3
- STAT 656 - Regression Analysis Credits: 3

Elective Credits

- 12 elective credits in MATH courses numbered 610 or higher, excluding MATH 653, 654, 655 and 799. Courses must be approved in advance by the student’s mathematical sciences academic advisor and the mathematical sciences graduate coordinator.
- 12 elective credits in 500-, 600-, or 700-level STAT courses, excluding STAT 535 and 799. Courses must be approved in advance by the student’s statistics academic advisor and the statistics graduate coordinator.

Total: 48 credits

Notes:
Students in either the BS/Accelerated MS in Mathematics Program or the BS/Accelerated MS in Statistics Program cannot get a reduction of 6 credits toward this dual degree. Students who want to proceed to a PhD degree will only be able to waive the number of credits specified in the associated PhD degree requirements, even though they will have 48 credits at the MS level.

- If a student decides not to complete the required 48 credits, a single MS degree will not be granted unless the student fulfills the requirements for either the MS in mathematics or the MS in statistical science.
- Once a student receives one of the MS degrees from either department, the student will no longer be eligible for the reduction in credit (i.e., will need to complete 30 credits) if the student later decides to earn the other MS degree.

Operations Research and Statistical Science Dual-Degree MS (STAT)

**Banner Codes:** VS-MS-OPRS, VS-MS-STAT

**School:** Volgenau School of Engineering

**Department:** Statistics

This program allows students to earn an MS in operations research and an MS in statistical science by completing 48 credits of course work in both areas instead of the 60 that would be required if the degrees were sought independently.

**Admission Requirements**

Applicants must satisfy admission requirements for the MS in Operations Research Program and the MS in Statistical Science Program. A joint faculty committee from the Statistics and Systems Engineering and Operations Research Departments make final admission decisions into the dual-degree program.

**Degree Requirements**

The dual-degree program requires a total of 48 credits as specified below:

- OR 541 - Operations Research: Deterministic Models Credits: 3
- OR 542 - Operations Research: Stochastic Models Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- OR 699 - Masters Project Credits: 3
- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 652 - Statistical Inference Credits: 3
- STAT 656 - Regression Analysis Credits: 3

**Elective Credits in OR Courses**

12 elective credits in OR courses at the 600 level, including at least one deterministic methods course and at least one stochastic methods course.

**Deterministic Methods Courses:**
- OR 641 - Linear Programming Credits: 3
• OR 642 - Integer Programming Credits: 3
• OR 643 - Network Modeling Credits: 3
• OR 644 - Nonlinear Programming Credits: 3

**Stochastic Methods Courses:**
• OR 645 - Stochastic Processes Credits: 3
• OR 647 - Queuing Theory Credits: 3
• OR 675 - Reliability Analysis Credits: 3
• OR 677 - Statistical Process Control Credits: 3

**Elective Credits in STAT Courses**

12 elective credits in 500-, 600-, or 700-level STAT courses, excluding 535. Courses must be approved in advance by the student's statistics academic advisor and the statistics graduate coordinator.

**Total: 48 credits**

**Notes:**

• A maximum of 6 credits across the two disciplines may be in independent research (thesis). The requirements for independent research are the same as detailed for the associated MS program.
• Students in either the BS/Accelerated MS in Operations Research Program or the BS/Accelerated MS in Statistics Program cannot get a reduction of 6 credits toward this dual degree. Students who want to proceed to a PhD degree will only be able to waive the number of credits specified in the associated PhD degree requirements, even though they will have 48 credits at the MS level.
• If a student decides not to complete the required 48 credits, a single MS degree will not be granted unless the student fulfills the requirements for the MS in operations research or the MS in statistical science.
• Once a student receives one of the MS degrees from either department, the student will no longer be eligible for the reduction in credit (i.e., will need to complete 30 credits) if the student later decides to earn the other MS degree.

**Master's Level Certificate**

**Federal Statistics Graduate Certificate**

**Banner Code: VS-CERG-FSS**

**School: Volgenau School of Engineering**

**Department: Statistics**

This professional program is targeted at upgrading the skills of practitioners. The federal statistical system is a complex data collection and analysis system that requires a wide variety of multidisciplinary skills for its maintenance. The federal statistics certificate is intended to respond to the need for broad training in statistics, survey methods, and data analysis, including graphics and
data visualization. The program is extremely flexible and can be tailored to the needs of students within the federal statistical sector. It is also intended to be responsive to the needs of those in state and local governments, and those in the private sector involved in the collection, interpretation, or statistical analysis of federal data.

The graduate certificate may only be pursued on a part-time basis.

**Admission Requirements**

Potential candidates must hold a bachelor’s degree and have taken at least two courses in calculus and one course in calculus-based probability and statistics. These minimal course requirements are normally satisfied by students who have successfully completed courses equivalent to the following Mason courses: MATH 113, MATH 114, and STAT 344. Candidates must also be computer literate. Applicants typically have degrees in such fields as sociology, economics, engineering, mathematics, statistics, and business. Candidates should inquire with the department’s graduate coordinator for information on program planning. Courses are offered in late afternoon and evening and are particularly suitable for part-time students.

**Certificate Requirements**

The certificate program consists of 12 credits: 9 credits of certificate courses plus 3 credits of electives. Some courses may have prerequisites beyond minimal admission requirements for which students must qualify or seek a waiver from the appropriate instructor.

**Certificate Courses (9 credits)**

The certificate courses build the foundations of statistical analysis and survey methods. All of these certificate courses, except for STAT 535, may be used for credit toward the MS in statistical science. Credit is granted for only one of STAT 535 and 554.

- STAT 535 - Analysis of Experimental Data Using SPSS Credits: 3
- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 574 - Survey Sampling I Credits: 3
- STAT 655 - Analysis of Variance Credits: 3
- STAT 656 - Regression Analysis Credits: 3
- STAT 657 - Nonparametric Statistics Credits: 3
- STAT 658 - Time Series Analysis and Forecasting Credits: 3
- STAT 662 - Multivariate Statistical Methods Credits: 3
- STAT 663 - Statistical Graphics and Data Exploration I Credits: 3
- STAT 665 - Categorical Data Analysis Credits: 3
- STAT 674 - Survey Sampling II Credits: 3
- STAT 763 - Statistical Graphics and Data Exploration II Credits: 3

**Elective Courses (3 credits)**

Elective courses may be chosen from STAT courses numbered 500-775.

**Total: 12 credits**
Doctoral Degree

Statistical Science, PhD

Banner Code: VS-PHD-STAT

School: Volgenau School of Engineering

Department: Statistics

The PhD in statistical science represents the highest academic attainment for a statistician and, as such, requires in-depth knowledge of modern statistical theory and practice. The degree program is a hybrid of mathematical theory, computation, and data analysis; and students are expected to be proficient in all three. Current research areas of key department faculty in the program include biometric identification, biostatistics, statistical genetics, statistical graphics, data confidentiality, networking analysis, and data exploration.

Admission Requirements

Students should have a Master's degree in a mathematically-intensive discipline with a minimum 3.50 GPA. Students entering with a Master's degree are expected to have completed coursework equivalent to STAT 544, 554, 652, and 656 with exceptional performance. The program also requires a course in advanced calculus (MATH 315 or equivalent) with a B or better. In exceptional circumstances, talented students with a mathematically-intensive undergraduate degree may be admitted. The GRE Exam is required for admission.

Reduction of Credit

Students must complete a minimum of 72 graduate credits, which may be reduced by a maximum of 24 credits with a Master’s degree in statistics, mathematics, or similar discipline. Reduction of credit requires the approval of the program director or designee and the dean or designee of the school. They determine whether the credits are eligible for reduction of credit and applicable to the degree program and the number of credits to be reduced. Students with an MS from GMU must complete a minimum of 72 credits from their combined MS and PhD programs.

Degree Requirements

The 72 hours of required doctoral-level credits typically consist of 48 credits of regular coursework and 24 credits of dissertation research. The following degree plan is based on a student who receives a full 24 credit reduction. Students who do not receive a full credit reduction should choose additional credits in consultation with their advisor.

Doctoral Course Work (24 credits)

Students are required to complete 24 credits of advanced emphasis course work, including three core courses:

- STAT 876 - Measure and Linear Spaces Credits: 3 or STAT 971 - Probability Theory Credits: 3
- STAT 972 - Mathematical Statistics I Credits: 3
- STAT 973 - Mathematical Statistics II Credits: 3
The remaining five courses are selected and approved by the doctoral supervisory committee and the PhD Program Director and should be numbered 600 or above. STAT 652 and 656 do not count toward the degree.

Qualifying Exam

Written qualifying exams will be taken in the following areas:

- Applied Probability
- Applied Statistics
- Statistical Inference

Qualifying exams are offered in August and January. Students are required to take the qualifying exams within one year of admission. Students who do not pass all three exams in two consecutive exam periods are terminated from the program.

Dissertation Research (24 credits)

In order to advance to candidacy, students must complete all coursework, pass the qualifying and comprehensive examinations, and defend a dissertation proposal.

Select 24 credits from the following:

- STAT 990 - Dissertation Topic Presentation Credits: 1
- STAT 998 - Doctoral Dissertation Proposal Credits: 1-12
- STAT 999 - Doctoral Dissertation Credits: 1-12 (must complete a minimum of 12 credits)

Doctoral Committee Selection

Following successfully passing the qualifying exams, students should select a dissertation director and a doctoral studies committee. The chair of the doctoral studies committee must be a member of the graduate faculty with a regular appointment in the Department of Statistics, and will typically be the dissertation director. The doctoral studies committee consists of a chair, two members of the graduate faculty who hold regular appointments in the Department of Statistics, and an external member. The doctoral studies committee must be approved by the director of the doctoral program in statistical science.

Advancement to Candidacy

Admission to candidacy is acquired on completion of an oral comprehensive exam administered by the doctoral supervisory committee, covering the three core courses and five advanced emphasis courses, and a dissertation proposal. The student is evaluated as pass, conditional pass, or fail. A student who fails the comprehensive exam may take it a second time, within six months. If the student fails a second time, the student is terminated from the program.

Doctoral Defense

The dissertation defense serves as the student’s final examination and is conducted by the doctoral supervisory committee. Both the comprehensive exam and final exam are scheduled on approval of a written request to the department chair.

For more information, e-mail specific questions to statistics@gmu.edu.

Total: 72 credits
Systems Engineering and Operations Research

Phone: 703-993-1670
Web: seor.gmu.edu

School: Volgenau School of Engineering

Faculty

Professors: Adelman, Chang, Chen, Hoffman, Nash, Polyak, Sage, Schum, Sofer (chair)

Associate professors: Brouse, Ganesan, Laskey, Loerch, Sherry, Shortle

Assistant professors: Xu

Affiliated faculty members: Houck

Research and term professors: Costa, Wagner, Wolman

Adjunct professors: Alexander, Bailey, Barry, Camp, Carley, Charboneau, Ferreiro, Humphrey, Killam, Laveson, McDevitt, Morris, Ness, Rothwell, Soller, Stanojevic, Stephenson, Stevens, Wagner, Wieland, Yost

Emeritus faculty: Donohue, Palmer

The Systems Engineering and Operations Research (SEOR) Department offers a bachelor’s degree in systems engineering, a minor in systems engineering and operations research, a master’s degree in systems engineering, a master's degree in operations research, and a doctoral degree in systems engineering and operations research. In addition, the department offers seven certificate programs at the master’s level: architecture-based systems integration; command, control, communications, computing, and intelligence (C4I); discovery, design and innovation; military operations research; computational modeling; systems engineering analysis and architecture; and systems engineering of software-intensive systems. The Department also offers a dual degree MS in Operations Research and Statistical Science jointly with the Statistics Department.

Systems engineers determine the most effective ways to use all of a system’s components: people, machines, materials, information, and energy. The engineers plan, design, implement, and manage integrated systems, working to ensure performance, safety, reliability, and maintainability. They also work to ensure that systems are delivered on time at a reasonable cost. Examples of systems are computer networks, the national airspace system, automobiles, intelligent robots, the electric grid, the Metro, and Mason. Whereas other engineering disciplines concentrate on individual aspects of a system, such as electronics, ergonomics, or software, systems engineers focus on the system as a whole. Systems engineering, perhaps more than any other engineering discipline, is involved with the human and organizational aspects of developing the desired system. Systems engineering is the people-oriented engineering profession. Systems engineering was rated as the number one job in 2009 by Money and PayScale.com, the top among top 100 careers with great pay and superior growth prospects.

Operations research is the professional field that uses analytical methods in engineering to support management decision making, often focusing on how best to allocate limited resources. Operations researchers do for organizations what physicists do for the physical world: they try to find order in apparent chaos by identifying the structure in complex situations and understanding how the components of organizations interact. The goal is to explain and predict the effects of actions taken on these systems. Much of this work is developing and manipulating mathematical and computer models of organizational systems composed of people, machines, information, and procedures. The overall purpose is to provide a rational basis for decision-making.

Mason's program in operations research focuses on quantitative modeling and analysis of complex-systems operating under uncertain conditions.
There is much overlap between systems engineering and operations research. The department encourages students of either discipline to elect courses in the other. For more information, go to seor.gmu.edu.

Course Work

The department offers all courses designated SEOR, SYST and OR in the Courses chapter of this catalog.

Undergraduate Degree

Systems Engineering, BS

Banner Code: VS-BS-SYST

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

The program leading to the BS in systems engineering prepares students for a professional career in systems engineering. The educational program reflects the systems engineer’s unique perspective, which considers all aspects of a system throughout its lifetime. Mason’s systems engineering program is interdisciplinary, drawing from engineering, computer science, operations research, psychology, and economics. The core systems engineering courses tie these diverse threads to provide a global understanding of how individual engineering disciplines fit into the development of complex, large-scale systems. Students gain depth in a technical area by selecting a sequence of technical electives that constitute an emphasis. Students choose their own emphasis with the help of their advisor. A year long senior design project provides hands-on experience in applying various systems engineering methods and tools.

The mission of the undergraduate program is to equip students with the ability to participate productively in the many professional activities associated with engineering a trustworthy system that satisfies client needs. The term “system” is interpreted broadly to include information, telecommunication, defense, health delivery, transportation, energy and manufacturing systems, as well as corporate processes.

The objectives of the Bachelor of Science in Systems Engineering Program at George Mason University are to produce graduates who are able to:

1. Apply critical thinking, quantitative methods, systems thinking, and principles of engineering to the engineering of contemporary and future systems.
2. Apply systems engineering methods, processes, models and tools to the engineering of contemporary and future systems.
3. Work successfully, professionally, and ethically as members and leaders of multi-disciplinary teams

This program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The requirements for the degree may be satisfied through part-time enrollment.

Degree Requirements

In addition to Mason’s general education requirements, students must meet specific requirements for this degree. In the first two years, students obtain a basic foundation in mathematics, the natural sciences, computing, writing, humanities, arts, and social sciences. The systems engineering program builds on this foundation, teaching theoretical knowledge, practical skills, and the ability to apply systems thinking to problems. Teamwork, collaborative learning, analytical skills, practical problem solving, and oral and written communication are strongly stressed.
Degree requirements for the systems engineering major include 120 credits. Students must complete the following:

**Mathematics and Statistics Credits: 23**

- MATH 113 - Analytic Geometry and Calculus I Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- MATH 203 - Linear Algebra Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3

**Natural Sciences Credits: 12**

- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- CHEM 251 - General Chemistry for Engineers Credits: 4  OR  CHEM 211 - General Chemistry Credits: 4

**Computer Science Credits: 7**

- CS 112 - Introduction to Computer Programming Credits: 4
- CS 211 - Object-Oriented Programming Credits: 3

**Communication and Economics Credits: 6**

- COMM 100 - Public Speaking Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3

**Engineering Credits: 2**

- ENGR 107 - Introduction to Engineering Credits: 2
Systems Engineering Credits: 52

Students must complete each of these courses with a grade of C or better.

- SYST 101 - Understanding Systems Engineering Credits: 3
- SYST 210 - Systems Design Credits: 3
- SYST 220 - Dynamical Systems I Credits: 3
- SYST 221 - Systems Modeling Laboratory Credits: 1
- SYST 320 - Dynamical Systems II Credits: 3
- SYST 330 - Systems Methods Credits: 3
- SYST 335 - Discrete Systems Modeling and Simulation Credits: 3
- SYST 371 - Systems Engineering Management Credits: 3
- SYST 470 - Human Factors Engineering Credits: 3
- SYST 473 - Decision and Risk Analysis Credits: 3
- SYST 489 - Senior Seminar Credits: 3
- SYST 490 - Senior Design Project I Credits: 3
- SYST 495 - Senior Design Project II Credits: 3
- OR 441 - Deterministic Operations Research Credits: 3
- OR 442 - Stochastic Operations Research Credits: 3
- 3 approved technical electives selected from one of the Technical Emphasis Areas below. Credits: 9

Additional University General Education Credits: 18

Students must complete all University General Education requirements not fulfilled by major requirements.

- ENGH 101 - Composition Credits: 3
- ENGH 302 - Advanced Composition Credits: 3 (must complete a natural sciences and technology section)
- Literature: 3 credits
- Arts: 3 credits
- Western Civilization/World History: 3 credits
- Global Understanding: 3 credits

Advising and Plan of Study

All systems engineering students are assigned a faculty advisor. With the advisor’s help and approval, each student is required to complete a plan of study. This plan of study, contained in the detailed pamphlet available from the SEOR office, constitutes a learning plan for the degree program. The plan of study must be signed by the student's advisor and the Department Chair. The plan of study must be updated and signed by the advisor at least once a year.

Technical Emphasis Areas

The systems engineering program requires 9 credits of technical electives. Students must select one of the following technical emphases, each containing three courses.
Aviation Systems

- SYST 420 - Network Analysis Credits: 3
- SYST 460 - Introduction to Air Traffic Control Credits: 3
- SYST 461 - Air Transportation System Engineering Credits: 3

Control Systems

- ECE 201 - Introduction to Signal Analysis Credits: 3
- ECE 220 - Signals and Systems I Credits: 3
- SYST 421 - Classical Systems and Control Theory Credits: 3

Computer Network Systems

- SYST 420 - Network Analysis Credits: 3
- ECE 465 - Computer Networking Protocols Credits: 3
- TCOM 500 - Modern Telecommunications Credits: 3

Engineering Systems

- CEIE 210 - Statics and Dynamics Credits: 3
- CEIE 240 - Hydraulics Credits: 3
- CEIE 310 - Mechanics of Materials Credits: 3

Operations Research

- OR 481 - Numerical Methods in Engineering Credits: 3
- SYST 420 - Network Analysis Credits: 3
- SYST 465 - Pricing in Optimization and Game Theory Credits: 3

Software-Intensive Systems

- CS 310 - Data Structures Credits: 3
- CS 321 - Software Requirements and Design Modeling Credits: 3
- CS 332 - Object-Oriented Software Design and Implementation Credits: 3

Synthesis Requirement

Mason’s synthesis requirement for systems engineering majors is satisfied by successful completion of SYST 495 - Senior Design Project II.
Writing-Intensive Requirement

Mason’s writing-intensive requirement for systems engineering majors is satisfied by successful completion of SYST 489 - Senior Seminar.

Total: 120 credits

Sample Schedule

The following sample schedule details the required and elective courses in the program. Students are strongly encouraged to follow this sample schedule to ensure that prerequisites are satisfied. For students who do not place into MATH 113 by taking the math placement exam, an alternative schedule is available. The position of the technical elective courses within the schedule will vary depending on the emphasis, and the position of some general education classes may vary as well. Please consult with your advisor to plan the correct sequence.

First Semester Credits: 15

- COMM 100 - Public Speaking Credits: 3
- ECON 103 - Contemporary Microeconomic Principles Credits: 3
- ENGH 101 - Composition Credits: 3
- ENGR 107 - Introduction to Engineering Credits: 2
- MATH 113 - Analytic Geometry and Calculus I Credits: 4

Second Semester Credits: 15

- CS 112 - Introduction to Computer Programming Credits: 4
- MATH 114 - Analytic Geometry and Calculus II Credits: 4
- PHYS 160 - University Physics I Credits: 3
- PHYS 161 - University Physics I Laboratory Credits: 1
- SYST 101 - Understanding Systems Engineering Credits: 3

Third Semester Credits: 16

- CS 211 - Object-Oriented Programming Credits: 3
- MATH 213 - Analytic Geometry and Calculus III Credits: 3
- PHYS 260 - University Physics II Credits: 3
- PHYS 261 - University Physics II Laboratory Credits: 1
- SYST 210 - Systems Design Credits: 3
• **Literature course** Credits: 3

**Fourth Semester Credits: 14**

- CHEM 251 - General Chemistry for Engineers Credits: 4  **OR**  CHEM 211 - General Chemistry Credits: 4
- MATH 203 - Linear Algebra Credits: 3
- MATH 214 - Elementary Differential Equations Credits: 3
- SYST 220 - Dynamical Systems I Credits: 3
- SYST 221 - Systems Modeling Laboratory Credits: 1

**Fifth Semester Credits: 15**

- ENGH 302 - Advanced Composition Credits: 3 (for natural sciences and technology)
- OR 441 - Deterministic Operations Research Credits: 3
- SYST 320 - Dynamical Systems II Credits: 3
- STAT 344 - Probability and Statistics for Engineers and Scientists I Credits: 3
- **Arts course** Credits: 3

**Sixth Semester Credits: 15**

- STAT 354 - Probability and Statistics for Engineers and Scientists II Credits: 3
- SYST 330 - Systems Methods Credits: 3
- SYST 335 - Discrete Systems Modeling and Simulation Credits: 3
- SYST 371 - Systems Engineering Management Credits: 3
- **Technical elective** Credits: 3

**Seventh Semester Credits: 15**

- SYST 470 - Human Factors Engineering Credits: 3
- SYST 489 - Senior Seminar Credits: 3
- SYST 490 - Senior Design Project I Credits: 3
- SYST 473 - Decision and Risk Analysis Credits: 3
- **Technical elective** Credits: 3

**Eighth Semester Credits: 15**
Termination from the Major

No math, science, or Volgenau School of Engineering course, required for the major, may be attempted more than three times. Those students who do not successfully complete such a course within three attempts will be terminated from the major. For more information, see the "Termination from the Major" section under Academic Standing.

Change of Major

Students who want to change their major to systems engineering must have a GPA of at least 2.75 in all math, physics, engineering, and computer science courses taken to fulfill requirements for the systems engineering degree and should have completed MATH 114 with a grade of B or better.

Interdisciplinary Minor Programs

By taking appropriate sequences of technical electives and, in some cases, a few courses in addition to the 120 credits required for graduation, students in the systems engineering program can obtain a minor in an interdisciplinary program. Minors of particular interest to systems engineering students include data analysis, mathematics, computer science, and business. Students should see their advisor and the departments offering the minors for specific requirements.

Undergraduate Minor

Systems Engineering and Operations Research Minor

Banner Code: SEOR

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

The minor in Systems Engineering and Operations Research consists of 15 credit hours of coursework. The specific requirements are as follows:

Course Work

For policies governing all minors, see the Academic Policies chapter of this catalog.

Two required SEOR courses:
Three additional courses from the following:

- SYST 371 - Systems Engineering Management Credits: 3
- SYST 469 - Human Computer Interaction Credits: 3 or SYST 470 - Human Factors Engineering Credits: 3
- SYST 460 - Introduction to Air Traffic Control Credits: 3
- SYST 461 - Air Transportation System Engineering Credits: 3
- SYST 473 - Decision and Risk Analysis Credits: 3
- OR 441 - Deterministic Operations Research Credits: 3 or MATH 441 - Deterministic Operations Research Credits: 3
- OR 442 - Stochastic Operations Research Credits: 3 or MATH 442 - Stochastic Operations Research Credits: 3
- OR 481 - Numerical Methods in Engineering Credits: 3 or MATH 446 - Numerical Analysis I Credits: 3

Prerequisites:

Some of the courses listed above have additional prerequisites. Students should pay careful attention to prerequisites when selecting courses.

Total: 15 credits

Bachelor's/Accelerated Master's Program

BS (selected)/Operations Research, Accelerated MS

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

Qualified undergraduate students may apply to this five-year program leading to a BS in an engineering discipline and an MS degree in operations research. The program can be completed in 144 credits. Applicants must be Mason undergraduate students majoring in systems engineering, computer science, computer engineering, electrical engineering, or civil and infrastructure engineering. Students may apply for the program after they have completed at least 90 credits applicable to the BS degree. Students must have an overall GPA of at least 3.30 on courses applicable to the BS degree and must have completed all MATH and PHYS requirements. Criteria for admission are identical to criteria for admission into the MS program, with the exception that students do not need to have completed an undergraduate degree before admission.

Students must complete all requirements for the BS in their chosen major. Students must apply to have the BS degree from the appropriate Volgenau School program conferred the semester before they expect to complete BS requirements. The MS degree is granted on completion of remaining courses.

Up to two courses (6 credits) of approved master’s level courses taken as part of the undergraduate degree may be applied to the graduate degree. These two courses may be chosen from the graduate courses in the following table. For
BS candidates, these graduate courses replace the corresponding undergraduate courses. The undergraduate version of these courses may not be applied to the MS degree.

<table>
<thead>
<tr>
<th>Undergraduate</th>
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Any other 500-level course may be applied to both the undergraduate and graduate degrees with approval of the advisor and SEOR department chair.

BS (selected)/Systems Engineering, Accelerated MS

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

Qualified undergraduate students may apply to this five-year program, which leads to a BS in an engineering discipline and an MS in systems engineering. The program can be completed in 144 credits. Applicants must be Mason undergraduate students majoring in systems engineering, computer science, computer engineering, electrical engineering, or civil and infrastructure engineering. Students may apply after they have completed at least 90 credits applicable to the BS degree.

Students must have an overall GPA of at least 3.30 in courses applicable to the BS degree and must have successfully completed all MATH and PHYS requirements. Students must complete all requirements for the BS in their chosen major. Students in the accelerated program must apply to have the BS degree from the appropriate Volgenau School program conferred the semester before they expect to complete BS requirements. The MS degree is granted on completion of remaining courses.

Up to two courses (6 credits) of approved master’s level courses taken as part of the undergraduate degree may be applied to the graduate degree. These two courses may be chosen from the graduate courses in the following table. For BS candidates, these graduate courses replace the corresponding undergraduate courses listed. The undergraduate version of these courses may not be applied toward the MS degree.

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Any other 500-level course may be applied to both the undergraduate and graduate degrees with approval of the advisor and SEOR department chair.
Systems Engineering, BS/Telecommunications, Accelerated MS

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

Students in the BS in Systems Engineering Program may elect to enter an accelerated MS in Telecommunications Program while they are undergraduate students. The program is designed for qualified undergraduate students in the systems engineering program who would like to proceed directly into the MS program, completing the two degrees with 144 credits. Students must satisfy requirements for the BS (120 credits) and the MS (30 credits), with 6 credits of overlap permitted. The MS is on an accelerated track, with 6 credits taken as an undergraduate and 24 credits completed as a graduate student. The 6 graduate credits that will count toward both degrees must be selected from those given in the listing that follows.

Applicants must be Mason undergraduate students who preferably have chosen to take the systems engineering of telecommunications elective sequence. Other students will be considered on their individual merit. Students may apply to the accelerated program during a semester after which they will have completed 90 or more credits applicable toward the BS in systems engineering. Students must have an overall GPA of at least 3.25 to apply for the program. Students who have not yet finished 90 credits may be accepted provisionally subject to satisfactory completion of 90 credits. Criteria for admission are identical to criteria for admission to the MS in Telecommunications Program, except that students do not need to have completed an undergraduate degree prior to admission into the accelerated program.

Accepted students must maintain a minimum 3.25 GPA in the undergraduate segment of the accelerated program and a 3.00 GPA in the graduate segment. That is, students who have been accepted into the program must maintain a 3.25 average until they have satisfied all requirements for the BS in systems engineering. They must then maintain a minimum 3.00 GPA in the graduate segment.

Students must complete all requirements for the BS in systems engineering. Students in the accelerated program must apply to have the BS degree conferred the semester before they expect to complete the BS requirements. The MS in telecommunications is granted on completion of all requirements for the accelerated degree.

Degree Requirements

Telecommunications courses

A systems engineering undergraduate student may choose from the following courses for their 6 credit overlap as part of the accelerated program:

- TCOM 500 - Modern Telecommunications Credits: 3
- TCOM 501 - Data Communications and Local Area Networks Credits: 1.5
- TCOM 502 - Wide Area Networks and Internet Credits: 1.5
- OR 541 - Operations Research: Deterministic Models Credits: 3
- SYST 530 - System Management and Evaluation Credits: 3
- SYST 573 - Decision and Risk Analysis Credits: 3 (if taken, replaces TCOM 521 in the telecommunications core requirements)

Master's Degree
Operations Research, MS

Banner Code: VS-MS-OPRS

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

This program prepares students for research and professional practice associated with the formulation and analysis of mathematical models for decision making and their computer implementation. Major components include optimization, queuing and network modeling, computer simulation and modeling, applied and computational probability, and application of these components to realistic and relevant operational analysis problems. Students are expected to become proficient in these areas, as well as in supporting areas of information technology necessary to implement operations research methods.

The program includes core courses and electives selected by the student with the aid of a faculty advisor. To obtain the MS degree, students complete an approved plan of study that contains a minimum of 30 graduate credits. Students may take courses through the Commonwealth Graduate Engineering Program. Appropriate courses may be transferred, with advisor approval, into this Mason degree program.

Admission Requirements

To be admitted to the program, students must hold a baccalaureate degree from an accredited institution in engineering, mathematics, computer science, physical sciences, economics, or a related field. They also must have completed courses in calculus (MATH 113, 114, and 213), matrix algebra (MATH 203), differential equations (MATH 214), applied probability and statistics (STAT 346), and a scientific programming language (CS 112).

Other requirements are as follows:

- Provide evidence of satisfactory educational achievement in at least one of the following forms: a GPA of at least 3.00 as an undergraduate or an acceptable GPA in graduate courses. International students must also achieve satisfactory scores on the GRE. Nonnative English speakers must have a satisfactory score on the TOEFL.
- Provide three letters of recommendation submitted by former professors or supervisors.

The department offers SYST 500 as an intensive review of undergraduate engineering mathematics, including matrix algebra, transforms, differential equations, probability, and statistics. On acceptance, students will be required to take a foundation qualification test a week or two before school starts, unless waived by the department chair or graduate coordinator. Students who fail the test will be required to take SYST 500. A sample test is available from the department.

Students with minor deficiencies in preparation may be accepted conditionally pending removal of the deficiencies. Courses taken to remove admission deficiencies (including SYST 500) extend minimum requirements for the degree. Students whose undergraduate training was in the quantitative social sciences or quantitatively oriented business administration may be allowed to complete a portion of the mathematics prerequisite by taking SYST 500.

Degree Requirements

The program consists of 30 credits. Students must complete four core courses and the project (15 credits). The remaining 15 credits are electives subject to the requirements below, and can be taken in one of five concentration areas or in an individual plan approved by the student's advisor.

Required Core Courses (12 credits):
• OR 541 - Operations Research: Deterministic Models Credits: 3
• OR 542 - Operations Research: Stochastic Models Credits: 3
• OR 635 - Discrete System Simulation Credits: 3
• STAT 544 - Applied Probability Credits: 3

Project (3 credits):

• OR 699 - Masters Project Credits: 3

Methods Courses (6 credits):

Students should take at least one deterministic methods and one stochastic methods course.

**Deterministic methods courses:**
• OR 640 - Global Optimization and Computational Intelligence Credits: 3
• OR 641 - Linear Programming Credits: 3
• OR 642 - Integer Programming Credits: 3
• OR 643 - Network Modeling Credits: 3
• OR 644 - Nonlinear Programming Credits: 3

**Stochastic methods courses:**
• OR 645 - Stochastic Processes Credits: 3
• OR 647 - Queuing Theory Credits: 3
• OR 675 - Reliability Analysis Credits: 3
• OR 674 - Dynamic Programming Credits: 3
• OR 677 - Statistical Process Control Credits: 3

Additional Electives (9 credits):

Up to three additional elective courses may be chosen with written concurrence of the advisor, one of which must be OR 600-level or higher. These courses should be taken in an area appropriate to the student’s interests, such as operations research, statistics, computer science, information systems, systems engineering, electrical and computer engineering, economics, mathematics or supply chain management. At least one of these electives must be taken from SEOR’s course offerings.

Concentrations

Students may construct concentration areas by choosing electives from among special groupings. The five concentrations available are decision analysis, financial engineering, military operations research, optimization, and stochastic modeling. In addition to the required core courses (12 credits) and project course (3 credits), the remaining 15 credit hours consist of methods and elective courses associated with the concentration areas as outlined below. Students can also devise their own grouping of electives subject to prior approval of their advisor.

▲ Concentration in Decision Analysis (DA)
Students concentrating in decision analysis must complete the following.

- OR 671 - Judgment and Choice Processing and Decision Making Credits: 3
- OR 681 - Decision and Risk Analysis Credits: 3
- SYST 664 - Bayesian Inference and Decision Theory Credits: 3
- one deterministic methods course
- one stochastic methods course

▲ Concentration in Financial Engineering (FNNE)

Students concentrating in financial engineering must complete the following:

- OR 588 - Financial Systems Engineering I: Introduction to Options, Futures, and Derivatives Credits: 3
- OR 688 - Financial Systems Engineering II: Derivative Products and Risk Management Credits: 3
and one course from the following list:
- OR 645 - Stochastic Processes Credits: 3
- OR 671 - Judgment and Choice Processing and Decision Making Credits: 3
- OR 681 - Decision and Risk Analysis Credits: 3
- OR 682 - Computational Methods in Engineering and Statistics Credits: 3

Students must also complete the following:

- one deterministic course
- one stochastics methods course (if the student has already taken OR 645 this can be substituted for an elective course with written concurrence of the student's advisor)

▲ Concentration in Military Operations Research (MOR)

Students concentrating in military operations research must complete the following.

- OR 651 - Military Operations Research I: Cost Analysis Credits: 3
- OR 652 - Military Operations Research Modeling II: Effectiveness Analysis Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3
- one deterministic methods course
- one stochastic methods course

▲ Concentration in Optimization (OPT)

Students concentrating in optimization must complete three courses from the following.

- OR 640 - Global Optimization and Computational Intelligence Credits: 3
- OR 641 - Linear Programming Credits: 3
- OR 642 - Integer Programming Credits: 3
- OR 643 - Network Modeling Credits: 3
- OR 644 - Nonlinear Programming Credits: 3
- OR 682 - Computational Methods in Engineering and Statistics Credits: 3
- OR 741 - Advanced Linear Programming Credits: 3

Students must also complete the following:
• one stochastic methods course
• one elective course with written concurrence of the student's advisor

▲ Concentration in Stochastic Modeling (STM)

Students concentrating in stochastic modeling must complete two courses from the following:

• OR 645 - Stochastic Processes Credits: 3
• OR 647 - Queuing Theory Credits: 3
• OR 674 - Dynamic Programming Credits: 3
• OR 677 - Statistical Process Control Credits: 3
• OR 719 - Computational Models of Probabilistic Reasoning Credits: 3
• SYST 664 - Bayesian Inference and Decision Theory Credits: 3

Students must also complete the following:
• one deterministic course
• one statistics course numbered 634 or above
• one elective course with written concurrence of the student's advisor

Total: 30 credits

Dual-Degree MS in Operations Research and Statistical Science

The program allows students to earn an MS in operations research and an MS in statistical science by completing 48 credits of course work in both areas instead of the 60 that would be required if the degrees were sought independently. See the corresponding catalog entry.

Systems Engineering, MS

Banner Code: VS-MS-SYST

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

Mason's educational and research program in Systems Engineering addresses a broad range of issues relevant to the design, implementation, analysis and management of systems. Specialization areas include Architecture-Based Systems Integration; Air Transportation; Systems Engineering Analysis; Systems Management; Command, Control, Communications, Computing, and Intelligence; and Systems Engineering of Software-Intensive Systems. Research activities include both fundamental and applied research. GMU's graduate program in Systems Engineering recognizes the importance of balancing an education in quantitative models and engineering tools with a proper understanding of the systems "perspective."

The program prepares students for a professional career in systems design, development, and management, associated with problem formulation, issue analysis, and evaluation of alternative courses of action. The program emphasizes both analytical and practical aspects of engineering complex systems. Students are expected to demonstrate proficiency in several quantitative modeling disciplines. Students are also expected to master issues relevant to practical aspects of systems design, engineering, and
management. The program prepares students for careers in research and development, and the pursuit of advanced graduate study leading to the PhD in information technology.

Each student is assigned a faculty advisor with whom to work to complete an approved plan of study. This plan of study must include three core courses, two methods courses, three to four electives in an emphasis area, and a thesis or systems engineering project. The plan of study must include 30 graduate credits including a capstone project (3 credits). Matriculation requirements for candidates needing additional work in mathematics or engineering also may be included in the plan of study.

Foundation and Admission Requirements

Applicants should have a baccalaureate degree from an accredited institution in engineering, mathematics, computer science, physical sciences, economics, or a related field. They also should have completed courses in calculus (MATH 113, 114, and 213), matrix algebra (MATH 203), differential equations (MATH 214), applied probability (STAT 346), and a scientific programming language (CS 112).

Other requirements are as follows:

- Evidence of satisfactory educational achievement in at least one of the following forms: a GPA of at least 3.00 as an undergraduate or an acceptable GPA in graduate courses. International students must also achieve satisfactory scores on the GRE. Nonnative English speakers must have achieved a satisfactory score on the TOEFL exam.
- Three letters of recommendation submitted by former professors or supervisors
- Working background in engineering mathematics and computer systems. Students with minor deficiencies in preparation may apply for admission to the program, but they will be required to take one or more foundation courses. The department offers SYST 500 as an intensive review of undergraduate engineering mathematics, including matrix algebra, transforms, differential equations, probability, and statistics.

Students who have not completed a basic engineering undergraduate mathematics sequence will be required to complete courses in engineering calculus and matrix algebra prior to acceptance. On acceptance, students will be required to take a foundation qualification test a week or two before school starts, unless waived by the department chair or graduate coordinator. Students who fail the test will be required to take SYST 500 or other foundation courses. A sample test is available from the department.

Familiarity with analytical modeling software, such as spreadsheets or math packages, is also expected. Students should acquaint themselves with these software packages before beginning classes.

Degree Requirements

Core Courses (12 credits):

- SYST 510 - Systems Definition and Cost Modeling Credits: 3
- SYST 520 - System Engineering Design Credits: 3
- SYST 530 - System Management and Evaluation Credits: 3
- SYST 611 - System Methodology and Modeling Credits: 3

Concentrations (15 credits):

Students must complete a set of four concentration-specific courses that, together with the basic methods courses, constitute a clearly defined concentration within systems engineering.
Students may construct concentration areas by choosing electives from among special groupings. The seven concentrations available are systems engineering analysis, systems management, architecture-based systems integration, command, control, communications, computing, and intelligence (C4I), systems engineering of software-intensive systems, advanced transportation systems, and financial systems engineering. Students can also devise their own grouping of electives subject to prior approval of their advisor.

**Basic Methods Courses**

Students must complete 3 credits of a basic methods course. The choice of basic methods course may depend on the student's concentration.

List of Basic Methods Courses:

- SYST 563 - Research Methods in Systems Engineering and Information Technology Credits: 3
- SYST 573 - Decision and Risk Analysis Credits: 3
- SYST 620 - Discrete Event Systems Credits: 3
- SYST 664 - Bayesian Inference and Decision Theory Credits: 3
- OR 541 - Operations Research: Deterministic Models Credits: 3
- OR 542 - Operations Research: Stochastic Models Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3

**▲Concentration in Advanced Transportation Systems (ATS)**

The air transportation system is among the most complex networked systems. This concentration is designed to provide students with the skills to address the next generation of challenges of the air transportation system. Topics addressed include congestion and safety of the national air space, economic and human factors, impact of technology innovation, and public policy. The program emphasizes design, modeling, and analysis to support decision making for government and the aviation industry.

**Basic methods course:**

- One course from the list of basic methods courses above.

**Concentration-specific courses:**

Students must complete the following:

- SYST 560 - Introduction to Air Traffic Control Credits: 3
- SYST 660 - Air Transportation Systems Modeling Credits: 3
  The remaining two courses are electives taken from the list below with the approval of the advisor. Courses designated as basic methods courses may also be used as an elective.
- SYST 571 - Systems Engineering Management Credits: 3
- SYST 619 - Introduction to Architecture Based Systems Engineering Credits: 3
- SYST 671 - Judgment and Choice Processing and Decision Making Credits: 3
- CSS 610 - Computational Analysis of Social Complexity Credits: 3
- OR 647 - Queuing Theory Credits: 3

**▲Concentration in Architecture-Based Systems Integration (ABSI)**
There is much interest today in the engineering of systems that comprise other component systems, where each of the component systems serves organizational and human purposes. These systems families are often categorized as systems of systems, federations of systems, or coalitions of systems. The design of architectures is a major ingredient in the design of systems families. Furthermore, it provides the conceptual basis for achieving system integration. This concentration covers the formulation of the system integration problem, definition of architecture frameworks, use of structured analysis and object-oriented methodologies for the design of architectures, modeling and simulation for the evaluation of architectures, and approaches to integration. Both defense and industrial applications are considered.

With careful planning, students who complete this concentration might be able to complete the Architecture-Based Systems Integration Graduate Certificate simultaneously with their MS.

Basic methods course:

- SYST 620 - Discrete Event Systems Credits: 3

Concentration-specific courses:

Students must complete the following courses:

- SYST 619 - Introduction to Architecture Based Systems Engineering Credits: 3
- SYST 621 - Systems Architecture Design Credits: 3
- SYST 513 - Total Systems Engineering, Reengineering and Enterprise Integration Credits: 3
- SYST 542 - Decision Support Systems Engineering Credits: 3
- SYST 571 - Systems Engineering Management Credits: 3
- SYST 622 - System Integration and Architecture Evaluation. Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3

▲Concentration in Command, Control, Communications, Computing, and Intelligence (C4I)

C4I systems are concerned with gathering, retrieving, analyzing, and disseminating time-sensitive information to achieve mission-critical objectives. These systems support military operations across the spectrum of conflict, intelligence operations, transportation monitoring, emergency response, drug interdiction, and law enforcement, among others. C4I systems include the equipment, people, and procedures necessary to accomplish the mission. The equipment may include a variety of sensors, communications systems, and information processing and decision-support systems.

The program focuses on the analysis, design, development, and management of C4I systems. Topics addressed include C4I architectures and software, communications, decision support, modeling and simulation, and sensor data fusion.

With careful planning, students who complete this concentration might be able to complete the Command, Control, Communications, Computing, and Intelligence Graduate Certificate simultaneously with their MS.

Basic methods course:
- OR 542 - Operations Research: Stochastic Models Credits: 3
  or
- ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3

**Concentration-specific courses:**

Students must take the following:

- SYST 680 - Principles of Command, Control, Communications, Computing, and Intelligence (C4I) Credits: 3
  or
- SYST 680 - Principles of C4I Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3
  The remaining two courses are electives taken from the list below with the approval of the advisor. Courses designated as basic methods courses may also be used as an elective.
- SYST 671 - Judgment and Choice Processing and Decision Making Credits: 3
- SYST 684 - Sensor Data Fusion Credits: 3
- SYST 760 - Special Topics in Command, Control, Communications, Computing, and Intelligence Systems Engineering Credits: 3
- OR 651 - Military Operations Research I: Cost Analysis Credits: 3
- OR 652 - Military Operations Research Modeling II: Effectiveness Analysis Credits: 3
- ECE 542 - Computer Network Architectures and Protocols Credits: 3
- ECE 630 - Statistical Communication Theory Credits: 3
- ECE 642 - Design and Analysis of Computer Communication Networks Credits: 3

▲ **Concentration in Financial Systems Engineering (FNSE)**

Financial engineering is a cross-disciplinary field which relies on mathematical finance, numerical methods, and computer simulations to make trading, hedging, and investment decisions, as well as facilitating the risk management of those decisions. While mathematics is indispensable in financial engineering, the concentration will try best to focus on the concepts and ideas of finance, while limiting the math within a scope acceptable to most students in engineering.

**Basic methods course:**

- One course from the list of basic methods courses above.

**Concentration-specific courses:**

Students must complete the following:

- SYST 588 - Financial Systems Engineering I: Introduction to Options, Futures, and Derivatives Credits: 3
- SYST 688 - Financial Systems Engineering II: Derivative Products and Risk Management Credits: 3
  The remaining two courses are electives taken from the list below with approval of the advisor. Courses designated as basic methods courses may also be used as an elective.
- SYST 573 - Decision and Risk Analysis Credits: 3
- SYST 664 - Bayesian Inference and Decision Theory Credits: 3
- SYST 671 - Judgment and Choice Processing and Decision Making Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- OR 645 - Stochastic Processes Credits: 3
• OR 682 - Computational Methods in Engineering and Statistics Credits: 3
• OR 719 - Computational Models of Probabilistic Reasoning Credits: 3
• MBA 705 - Venture Capital and Private Finance Credits: 3
• MBA 706 - Investment Analysis Credits: 3
• MBA 717 - International Finance Credits: 3
• MBA 747 - Real Estate Finance Credits: 3

▲Concentration in Systems Engineering Analysis (SEA)

Systems engineers must address a broad range of issues relevant to the design, implementation, analysis, and management of systems. This concentration provides methodological tools that can be applied to the systems engineering process. Areas of focus include decision support systems, distributed intelligent systems, knowledge-based planning systems, network systems, probabilistic reasoning systems, sensor fusion systems, and optimization methods.

With careful planning, students who complete this concentration might be able to complete the Systems Engineering Analysis and Architecture Graduate Certificate simultaneously with their MS.

Basic methods course:

• One course from the list of basic methods courses above.

Concentration-specific courses:

Students must complete the following course:

• SYST 542 - Decision Support Systems Engineering Credits: 3
  The remaining three courses are electives taken from the list below with the approval of the advisor. Courses designated as basic methods courses may also be used as an elective.
• SYST 619 - Introduction to Architecture Based Systems Engineering Credits: 3
• SYST 621 - Systems Architecture Design Credits: 3
• SYST 671 - Judgment and Choice Processing and Decision Making Credits: 3
• SYST 683 - Modeling, Simulation, and Gaming Credits: 3
• OR 641 - Linear Programming Credits: 3
• OR 642 - Integer Programming Credits: 3
• OR 643 - Network Modeling Credits: 3
• OR 644 - Nonlinear Programming Credits: 3

▲Concentration in Systems Engineering of Software-Intensive Systems (SESI)

This concentration addresses the software component of the systems engineering life cycle. It specifically covers the allocation of system requirements to software. Practitioners are concerned with the theoretical and practical aspects of technology, cost, and the social effect of computer systems that are reliable, maintainable, secure, efficient, and cost effective. The program emphasizes the integration of hardware, software, and firmware, and the management of these complex computer systems over their life cycle through systems engineering methods, tools, and processes.

With careful planning, students who complete this concentration might be able to complete the Systems Engineering of Software-Intensive Systems Graduate Certificate simultaneously with their MS.
Basic methods course:

- One course from the list of basic methods courses above.

Concentration-specific courses:

Students must take the following:

- SYST 513 - Total Systems Engineering, Reengineering and Enterprise Integration Credits: 3
- SYST 619 - Introduction to Architecture Based Systems Engineering Credits: 3
  The remaining two courses are electives taken from the list below with the approval of the advisor. Courses designated as basic methods courses may also be used as an elective.
- CS 571 - Operating Systems Credits: 3
- CS 631 - Object-Oriented Design Patterns Credits: 3
- INFS 622 - Information Systems Analysis and Design Credits: 3
- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- SYST 540 - Analysis for Systems Management Credits: 3
- SYST 542 - Decision Support Systems Engineering Credits: 3
- SYST 571 - Systems Engineering Management Credits: 3
  and/or one only of the following:
- CS 555 - Computer Communications and Networking Credits: 3
- ECE 542 - Computer Network Architectures and Protocols Credits: 3
- INFS 612 - Principles and Practices of Communication Networks Credits: 3

▲Concentration in Systems Management (SMG)

The management aspect of systems engineering involves tracking and control of system development through the major phases of the system lifecycle, identifying and resolving problems to minimize their effect on cost, schedule, or performance, and iteratively improving product and process. This concentration emphasizes the theory and practice of systems management and prepares students for careers in managing the development of complex systems.

Basic methods course:

- One course from the list of basic methods courses above.

Concentration-specific courses:

Students must take the following:

- SYST 571 - Systems Engineering Management Credits: 3
- SYST 619 - Introduction to Architecture Based Systems Engineering Credits: 3
  The remaining two courses are electives taken from the list below with the approval of the advisor. Courses designated as basic methods courses may also be used as an elective.
- SYST 513 - Total Systems Engineering, Reengineering and Enterprise Integration Credits: 3
- SYST 540 - Analysis for Systems Management Credits: 3
- SYST 542 - Decision Support Systems Engineering Credits: 3
- SYST 621 - Systems Architecture Design Credits: 3
- SYST 622 - System Integration and Architecture Evaluation. Credits: 3
• SYST 671 or OR 671 - Judgment and Choice Processing and Decision Making Credits: 3
• SYST 677 or OR 677 - Statistical Process Control Credits: 3

Project (3 credits) or Thesis (6 credits)

Students must complete a capstone project (3 credit hours) or thesis (6 credit hours) under the direction of a Systems Engineering faculty member.

Under the project option, the student completes three credit hours of SYST 699. Students in these courses work in teams on an approved applied project. A project report is submitted at the end of the semester, and a final project presentation is made to the entire faculty of the SEOR Department.

Under the thesis option, the student completes six credit hours of SYST 799. The master's thesis should reflect a significant independent research effort. The work is conducted under the guidance of a faculty thesis advisor, and the final written thesis and oral defense are approved by a three-member faculty committee and submitted to the library. The thesis work is expected to be completed while taking six semester hours of SYST 799. Although a student is required to maintain continuous enrollment by registering for SYST 799 each semester until the thesis is completed, only six hours will be applied to the degree. The thesis option requires approval by the department chair and approval is only given in rare circumstances.

• SYST 699 - Masters Project Credits: 3
  or
• SYST 799 - Master's Thesis Credits: 1-6

Total: 30 credits

Dual Master's

Operations Research and Statistical Science Dual-Degree MS (OPRS)

Banner Codes: VS-MS-OPRS, VS-MS-STAT

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

This program allows students to earn an MS in operations research and an MS in statistical science by completing 48 credits of course work in both areas instead of the 60 that would be required if the degrees were sought independently.

Admission Requirements

Applicants must satisfy admission requirements for the MS in Operations Research Program and the MS in Statistical Science Program. A joint faculty committee from the Statistics and Systems Engineering and Operations Research Departments make final admission decisions into the dual-degree program.
Degree Requirements

The dual degree program requires a total of 48 credits as specified below.

Required Courses (24 credits)

- OR 541 - Operations Research: Deterministic Models Credits: 3
- OR 542 - Operations Research: Stochastic Models Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- OR 699 - Masters Project Credits: 3
- STAT 544 - Applied Probability Credits: 3
- STAT 554 - Applied Statistics Credits: 3
- STAT 652 - Statistical Inference Credits: 3
- STAT 656 - Regression Analysis Credits: 3

Elective Credits in OR Courses (12 credits)

12 elective credits in OR courses at the 600 level, including at least one deterministic methods course and at least one stochastic methods course.

**Deterministic Methods Courses:**
- OR 641 - Linear Programming Credits: 3
- OR 642 - Integer Programming Credits: 3
- OR 643 - Network Modeling Credits: 3
- OR 644 - Nonlinear Programming Credits: 3

**Stochastic Methods Courses:**
- OR 645 - Stochastic Processes Credits: 3
- OR 647 - Queuing Theory Credits: 3
- OR 675 - Reliability Analysis Credits: 3
- OR 677 - Statistical Process Control Credits: 3

Elective Credits in STAT Courses (12 credits)

12 elective credits in 500-, 600-, or 700-level STAT courses, excluding 535. Courses must be approved in advance by the student's statistics academic advisor and the statistics graduate coordinator.

Notes:

- A maximum of 6 credits across the two disciplines may be in independent research (thesis). The requirements for independent research are the same as detailed for the associated MS program.
- Students in either the BS/Accelerated MS in Operations Research Program or the BS/Accelerated MS in Statistics Program cannot get a reduction of 6 credits toward this dual degree. Students who want to proceed to a PhD degree will
only be able to waive the number of credits specified in the associated PhD degree requirements, even though they will have 48 credits at the MS level.

- If a student decides not to complete the required 48 credits, a single MS degree will not be granted unless the student fulfills the requirements for the MS in operations research or the MS in statistical science.

Total: 48 credits

Master's Level Certificate

Architecture-Based Systems Integration Graduate Certificate

Banner Code: VS-CERG-ABSI

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

This program is available to students who hold bachelor’s degrees in engineering and scientific disciplines or have graduate status in such programs. Admission requirements are identical to those for the master’s degree in systems engineering.

The graduate certificate may only be pursued on a part-time basis.

Certificate Requirements

The following four courses (12 credits) must be completed with a grade of B or better:

- SYST 520 - System Engineering Design Credits: 3
- SYST 619 - Introduction to Architecture Based Systems Engineering Credits: 3
- SYST 620 - Discrete Event Systems Credits: 3
- SYST 621 - Systems Architecture Design Credits: 3

Total: 12 credits

Completing the ABSI Certificate within the Systems Engineering Master's Program

In addition to the ABSI Certificate courses students must take six courses (18 credits) including:

- SYST 510 - Systems Definition and Cost Modeling Credits: 3
- SYST 530 - System Management and Evaluation Credits: 3
- SYST 611 - System Methodology and Modeling Credits: 3
- SYST 699 - Masters Project Credits: 3
Two approved electives from the ABSI Emphasis. Credits: 6

Command, Control, Communications, Computing, and Intelligence Graduate Certificate

Banner Code: VS-CERG-C4I

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

C4I systems are concerned with gathering, retrieving, analyzing, and disseminating time-sensitive information to achieve mission-critical objectives. These systems support military operations across the spectrum of conflict, intelligence operations, transportation monitoring, emergency response, drug interdiction, and law enforcement, among others. C4I systems include the equipment, people, and procedures necessary to accomplish the mission. The equipment may include a variety of sensors, communications systems, and information processing and decision-support systems.

The C4I certificate program focuses on the analysis, design, development, and management of C4I systems. Topics addressed include C4I architectures and software, communications, decision support, modeling and simulation, and sensor data fusion.

The program is available to students who hold bachelor’s degrees in engineering and scientific disciplines or are in graduate status in such programs. Admission requirements are identical to those for the master’s degree in systems engineering.

The graduate certificate may only be pursued on a part-time basis.

Certificate Requirements

The certificate requires 15 credits (5 courses). Students must complete the following with an average grade of B or better:

- SYST 680 - Principles of Command, Control, Communications, Computing, and Intelligence (C4I) Credits: 3 or ECE 670 - Principles of C4I Credits: 3
- OR 542 - Operations Research: Stochastic Models Credits: 3 or ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering Credits: 3
- SYST 664 - Bayesian Inference and Decision Theory Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3
- SYST 684 - Sensor Data Fusion Credits: 3
- SYST 760 - Special Topics in Command, Control, Communications, Computing, and Intelligence Systems Engineering Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- OR 651 - Military Operations Research I: Cost Analysis Credits: 3
- OR 652 - Military Operations Research Modeling II: Effectiveness Analysis Credits: 3
- ECE 542 - Computer Network Architectures and Protocols Credits: 3
- ECE 630 - Statistical Communication Theory Credits: 3
- ECE 642 - Design and Analysis of Computer Communication Networks Credits: 3

Total: 15 credits
Completing the C4I Certificate within the Systems Engineering Master's Program

In addition to the five certificate courses above, students must complete the following five courses:

- SYST 510 - Systems Definition and Cost Modeling Credits: 3
- SYST 520 - System Engineering Design Credits: 3
- SYST 530 - System Management and Evaluation Credits: 3
- SYST 611 - System Methodology and Modeling Credits: 3
- SYST 699 - Masters Project Credits: 3

Computational Modeling Graduate Certificate

**Banner Code:** VS-CERG-CCM

**School:** Volgenau School of Engineering

**Department:** Systems Engineering and Operations Research

This certificate program provides knowledge, tools, and techniques to those who work or plan to work in the field of computational modeling. Courses taken for this certificate program can count toward a master’s degree in operations research or statistics or a PhD in computational sciences and informatics. One must be concurrently enrolled in the program for courses to count toward the certificate and the other degree.

For admission into the certificate program, applicants must meet minimum entrance requirements for the MS in operations research, the MS in statistical science, or the PhD in computational sciences and informatics.

The graduate certificate may only be pursued on a part-time basis.

Certificate Requirements

**Required Courses (9 credits)**

- OR 541 - Operations Research: Deterministic Models Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
  and 3 credits chosen from the following:
  - OR 682 - Computational Methods in Engineering and Statistics Credits: 3
  - MATH 685 - Numerical Methods Credits: 3
  - CSI 700 - Numerical Methods Credits: 3

**Electives (3 credits)**

Choose one of the following:
- CSI 744 - Linear and Nonlinear Modeling in the Natural Sciences Credits: 3
- OR 542 - Operations Research: Stochastic Models Credits: 3
- SYST 611 - System Methodology and Modeling Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3
- ECE 521 - Modern Systems Theory Credits: 3
- MATH 673 - Dynamical Systems Credits: 3

Total: 12 credits

Discovery, Design, and Innovation Graduate Certificate

**Banner Code: VS-CERG-DDI**

**School: Volgenau School of Engineering**

**Department: Systems Engineering and Operations Research**

This program responds to the growing need for professional knowledge in innovation. It provides a balanced understanding of the entire process: discovery of knowledge, use in inventive problem solving, development of inventions, and familiarity with using various inventive design methods and tools. The program is available to students who hold master’s degrees in engineering and scientific disciplines or who are in such graduate programs. Students may pursue the certificate concurrently with any of the graduate programs in the Volgenau School; however, the certificate is not awarded until all requirements have been completed.

The graduate certificate may only be pursued on a part-time basis.

**Certificate Requirements**

Certificate candidates must complete at least 15 credits with an average grade of B or better.

To obtain the certificate, students must take:

- SYST 520 - System Engineering Design Credits: 3
- SYST 944 or OR 944 - The Process of Discovery and Its Enhancement in Engineering Applications Credits: 3
- CEIE 894 - Design and Inventive Engineering Credits: 3

and two of the following:

- CEIE 601 - Infrastructure Modeling Credits: 3
- SYST 573 - Decision and Risk Analysis Credits: 3 (recommended if going on for MS in civil and infrastructure engineering)
- SYST 664 or STAT 664 - Bayesian Inference and Decision Theory Credits: 3
- SYST 781 - Data Mining and Knowledge Discovery Credits: 3
- STAT 652 - Statistical Inference Credits: 3
- SYST 671 or OR 671 - Judgment and Choice Processing and Decision Making Credits: 3
Military Operations Research Graduate Certificate

Banner Code: VS-CERG-MOR

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

This program provides knowledge, tools, and techniques to those who work or plan to work in the field of military operations research. It is appropriate for students who cannot complete requirements for a master’s degree in operations research, but who want a concentrated study of military modeling. Admissions requirements are identical to those for the master’s degree in operations research.

Certificate candidates must complete five courses, with an average grade of B or better, for a total of 15 graduate credits.

The graduate certificate may only be pursued on a part-time basis.

Certificate Requirements

To obtain the certificate, a student needs to complete the following:

- OR 541 - Operations Research: Deterministic Models Credits: 3
- OR 635 - Discrete System Simulation Credits: 3
- OR 651 - Military Operations Research I: Cost Analysis Credits: 3
- OR 652 - Military Operations Research Modeling II: Effectiveness Analysis Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3

Total: 15 credits

Systems Engineering Analysis and Architecture Graduate Certificate

Banner Code: VS-CERG-SEAA

School: The Volgenau School of Information Technology and Engineering

Department: Systems Engineering and Operations Research

The graduate certificate in Systems Engineering Analysis and Architecture (SEAA) is intended for students who want to advance their knowledge in systems engineering analysis, design and architecture. Students get an understanding of the theory and/or
tools of the systems life cycle, systems requirements and cost modeling, systems design, architecture-based systems engineering, the design of systems of systems, and a selection of other techniques applicable to systems engineering analysis.

The SEAA certificate program will be open to all students who hold a BS degree in scientific and engineering disciplines from an accredited university program, with a GPA minimum established by VSE for all MS programs. Students who are already enrolled in a master's program must submit an application form to enroll in this certificate program; all others must apply for graduate admission to this certificate program.

The graduate certificate may only be pursued on a part-time basis.

Certificate Requirements

To be eligible for a certificate in Systems Engineering Analysis and Architecture, students must complete three required courses (9 credits) plus one elective course (3 credits) with an average grade of B or better. The three required courses are as follows:

- SYST 510 - Systems Definition and Cost Modeling Credits: 3
- SYST 520 - System Engineering Design Credits: 3
- SYST 619 - Introduction to Architecture Based Systems Engineering Credits: 3

Elective Requirement

Choose one course from the following:

- OR 635 - Discrete System Simulation Credits: 3
- SYST 542 - Decision Support Systems Engineering Credits: 3
- SYST 563 - Research Methods in Systems Engineering and Information Technology Credits: 3
- SYST 571 - Systems Engineering Management Credits: 3
- SYST 573 - Decision and Risk Analysis Credits: 3
- SYST 683 - Modeling, Simulation, and Gaming Credits: 3
- SYST 620 - Discrete Event Systems Credits: 3
- SYST 621 - Systems Architecture Design Credits: 3

Total: 12 credits

Systems Engineering of Software-Intensive Systems Graduate Certificate

Banner Code: VS-CERG-SIS

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

This certificate is available to any student who holds a bachelor’s degree in an engineering or scientific discipline or has graduate status in such a program. Admission requirements are identical to those for the master’s degree in systems engineering, except
that the math requirements include only MATH 113, MATH 114, and a probability and statistics course. Note: Some certificate electives may require stronger math requirements.

The graduate certificate may only be pursued on a part-time basis.

Certificate Requirements

To be eligible for a certificate in Systems Engineering for Software-Intensive Systems, students must complete two required courses (6 credits) plus two elective courses (6 credits) with an average grade of B or better.

Required Courses (6 credits)

- SYST 510 - Systems Definition and Cost Modeling Credits: 3
- SYST 542 - Decision Support Systems Engineering Credits: 3

Electives (6 credits)

The two elective courses must be selected from the following:

- SYST 520 - System Engineering Design Credits: 3
- SYST 619 or ECE 672 - Introduction to Architecture-Based Systems Engineering Credits: 3
- CS 555 - Computer Communications and Networking Credits: 3
- SWE 619 - Object-Oriented Software Specification and Construction Credits: 3
- ECE 542 - Computer Network Architectures and Protocols Credits: 3
- INFS 612 - Principles and Practices of Communication Networks Credits: 3
  Note: Only one of CS 555, ECE 542 and INFS 612 may be taken.

Total: 12 credits

Doctoral Degree

Systems Engineering and Operations Research, PhD

Banner Code: VS-PHD-SEOR

School: Volgenau School of Engineering

Department: Systems Engineering and Operations Research

The doctoral program in Systems Engineering and Operations Research offers a unique integration of systems engineering and operations research. This integration gives students a strong analytical and computational capability on the one hand and an overarching systems perspective that is well-grounded in application on the other. No other department in the nation offers a PhD
degree program that covers systems engineering and operations research in this integrated manner. The program prepares students for leadership positions in research and development in government, industry, research organization, and academia.

The program includes: course requirements; a qualifying exam that tests fundamental concepts in systems engineering and operations research; a comprehensive exam that tests the research competency of the student; dissertation proposal defense; dissertation research; and dissertation predefense and defense. All general Mason and specific Volgenau School requirements apply to this program.

PhD dissertations are extremely time intensive, and successful completion requires full time focus. It is expected that students who have reached candidacy (that is, successfully presented their dissertation proposal) will spend full time on their research for at least one academic year and will attend the majority of the SEOR departmental seminars throughout that period.

**Admission**

All general Mason and specific Volgenau School admissions requirements apply. Candidates for the PhD program typically must hold an MS degree from an accredited institution of higher education in systems engineering, operations research or related areas in engineering, mathematics, and computer science with a minimum graduate GPA of 3.50 and a minimum undergraduate GPA of 3.00. In addition, well-qualified candidates holding a BS degree in these areas may apply directly to the PhD program.

All applicants should have a strong background in engineering mathematics, which includes three semesters of calculus, differential equations, linear algebra, and probability. In addition, students entering the doctoral program must have a sound working knowledge in computing.

The admission process involves submitting the application for admission, undergraduate and graduate transcripts from previous colleges and universities attended, GRE test results, three letters of reference, a résumé and a statement of career goals and aspirations, and a self-assessment of past background. Translations of international credentials must be provided, if they are not in English; in some cases, applicants will be required to have documents evaluated by an external agency. A satisfactory score on the TOEFL examination is required for non-native English speakers. All of an applicant’s background is examined before an admission decision is made.

**Reduction of Credit**

The doctoral program is a 72 credit hour program; however, students entering with a Master's degree in a related discipline will be given a reduction of credit up to 24 hours. Reduction of credit requires the approval of the program director or designee and the dean or designee of the school. They determine whether the credits are eligible for reduction of credit and applicable to the degree program and the number of credits to be reduced.

**Degree Requirements**

The 72 hours of required doctoral-level credits typically consist of 48 credits of coursework and 24 credits of dissertation research. Students who receive a reduction of credit will complete a minimum of 48 credits as follows; students entering without an MS will need at least 24 additional credits of coursework.

All decisions concerning the student’s course requirements and plan of study must be approved by the dissertation committee chair, as well as by the department’s doctoral coordinator.

**Doctoral Coursework (24 credits)**

A GPA of 3.50 is required, and no grade of C is allowed in these 24 credits.

Students lacking prerequisites for their courses or lacking the coursework to complete the qualifying exams or their dissertation may be required to take additional courses.
• STAT 554 - Applied Statistics Credits: 3
• SYST 763 - Research Methods in Systems Engineering and Information Technology Credits: 3
• 12 credits of 700-level SEOR approved courses: a list of approved courses is available from the department
• 6 credits in SYST or OR courses numbered 600 or higher, excluding SYST 699 Master's Project and OR 699 Master's Project
  No more than 3 credits are allowed for a directed reading course.
  All courses and course substitutions must be approved by the student's dissertation committee chair and the SEOR doctoral coordinator.

Additional Coursework Requirements (24 credits)

Students entering without a Master's degree are required to complete an additional 24 credits of Master's level courses, including the following:

• SYST 510 - Systems Definition and Cost Modeling Credits: 3
• SYST 520 - System Engineering Design Credits: 3
• OR 541 - Operations Research: Deterministic Models Credits: 3
• OR 542 - Operations Research: Stochastic Models Credits: 3
• 12 additional credits from one of two alternatives (systems engineering or operations research). Consult the SEOR Department for the list of allowable courses.
  With appropriate selection of courses, students may obtain the MS degree in Systems Engineering or Operations Research by completing 6 additional credits, including 3 approved credits from the advanced emphasis courses (which may also apply towards the PhD degree advanced emphasis requirements) and 3 credits of either SYST 699 or OR 699. Consult the SEOR Department for further detail. Credits taken in the courses SYST 699 or OR 699 may not be applied towards the PhD degree program requirements.

Qualifying Exams

The exams are primarily for testing the students' familiarity with fundamental concepts. Each student must take the following four exams within two years of enrolling in the program:

1. Systems Definition and Cost Modeling
2. Systems Engineering Design
3. Deterministic Models
4. Stochastic Models

A student who passes three of the four exams in the first attempt must retake and pass the failed exam within one year. A student who passes fewer than three exams in the first attempt must retake and pass an entire set of four exams within one year. After two unsuccessful attempts, a student is dismissed from the PhD program.

Dissertation Research (24 credits)

Choose 24 credits from the following:

• SEOR 998 - Doctoral Dissertation Proposal Credits: 1-12
• SEOR 999 - Doctoral Dissertation Credits: 1-12 (must complete a minimum of 12 credits)

Doctoral Supervisory Committee
Students should select a dissertation director and a doctoral supervisory committee as soon as possible. It is recommended that the committee be formed by the end of the second or third semester of study. The dissertation director must be a member of the SEOR graduate faculty or a member of the Mason graduate faculty with approval from the SEOR department chair. The doctoral supervisory committee must include at least three members from the SEOR department-approved graduate faculty, and at least one non-SEOR member from the Mason graduate faculty. The composition of the doctoral supervisory committee is to be approved by the doctoral coordinator. At least four members of the committee must be members of the Mason graduate faculty.

**Comprehensive Exam**

The comprehensive exam is taken after the student has satisfactorily completed all the advanced emphasis coursework requirements in the approved plan of study filed by the student. The examiners will include the supervisory committee plus any outside examiners considered appropriate. However, the supervisory committee determines whether the student passes or not. The comprehensive exam consists of a written examination of 8 hours in length and an oral examination. The committee will determine if the student has a mastery of the advanced emphasis coursework. If a student fails the comprehensive exam, the student may request a re-examination within 60 days of receiving notice of the exam result. The request should be made in writing to the doctoral coordinator. If the student fails the re-examination or does not request a re-examination within 60 days, the student will be dismissed from the PhD program. In such a case, with recommendation of the supervisory committee and approval of the SEOR Chair, the student may apply his/her coursework towards a Master's degree.

**Dissertation Proposal**

After passing the comprehensive exam, each doctoral student prepares a written dissertation proposal, which is presented to the doctoral supervisory committee. After successfully completing this requirement, the student is formally admitted as a candidate for the PhD degree.

**Dissertation Defense**

When the central portions of the research have been completed to the point where the student is able to describe the original contributions of the dissertation effort, a candidate submits the written dissertation to the supervisory committee and schedules an oral predefense with the committee. The predefense is attended by the supervisory committee and the department's doctoral coordinator. The supervisory committee must approve the work or the student must schedule a second predefense.

Once the committee believes the student is ready, a final public oral defense may be scheduled no sooner than one month after the conclusion of the predefense, with an announcement posted for at least two weeks. Following a satisfactory evaluation of the oral defense of the dissertation by the supervisory committee, the student must prepare, with supervision from the dissertation director, a final publishable dissertation that represents a definitive contribution to knowledge in systems engineering and operations research. This document must meet format guidelines specified by the Guide for Preparing Graduate Theses, Dissertations, and Projects. If the student fails to successfully defend the dissertation, the student may request a second defense, following the same procedures as for the initial defense. There is no time limit for this request, other than the general time limits for the doctoral degree. An additional predefense is not required, but the student is strongly advised to consult with the committee before scheduling a second defense. If the student fails on the second attempt to defend the dissertation, the student will be dismissed from the PhD program.

**Total: 72 credits**
VS-AIT Technical Focus Courses

Students must satisfy all prerequisites and other requirements in order to take any of the courses listed below. Courses chosen for the technical focus must be chosen with a coordinator in the AIT department. Not all courses are offered each semester.

CEIE 290 - Engineering Computation and Design (3 credits)
CEIE 301 - Engineering and Economic Models in Civil Engineering (3 credits)
CS 112 - Introduction to Computer Programming (4 credits)
CS 211 - Object-Oriented Programming (3 credits)
CS 310 - Data Structures (3 credits)
ECE 201 - Introduction to Signal Analysis (3 credits)
ECE 301 - Digital Electronics (3 credits)
ECE 303 - Digital Design/Intro Assembly Language (4 credits)
GGS 300 - Quantitative Methods for Geographical Analysis (3 credits)
GGS 311 - Introduction to Geographic Information Systems (3 credits)
IT 207 - Applied IT Programming (3 credits)
IT 212 - Computer Hardware Fundamentals (3 credits)
IT 213 - Multimedia and Web Design (3 credits)
IT 214 - Database Fundamentals (3 credits)
IT 223 - Information Security Fundamentals (3 credits)
IT 300 - Modern Telecommunications (3 credits)
IT 304 - IT in the Global Economy (3 credits)
IT 308 - Event-Driven Programming (3 credits)
IT 314 - Database Management (3 credits)
IT 331 - Web I: Web Development (3 credits)
IT 341 - Data Communications and Network Principles (3 credits)
IT 348 - Cloud Computing (3 credits)
IT 353 - Information Defense Technologies (3 credits)
IT 357 - Computer Crime, Forensics, and Auditing (3 credits)
IT 366 - Network Security I (3 credits)
IT 413 - Digital Media Editing (3 credits)
IT 414 - Database Administration (3 credits)
IT 462 - Information Security Principles (3 credits)
MATH 112 - Discrete Mathematics for IT (3 credits)
MUSI 415 - Music in Computer Technology (3 credits)
NCLC 249 - Digital Literacy (4 credits)
NCLC 345 - Introduction to Multimedia (5 credits)
NCLC 445 - Multimedia Design (5 credits)
OM 301 - Operations Management (3 credits)
OR 441 - Deterministic Operations Research (3 credits)
SOCI 313 - Statistics for the Behavioral Sciences (4 credits)
STAT 250 - Introductory Statistics I (3 credits)
STAT 350 - Introductory Statistics II (3 credits)
STAT 362 - Introduction to Computer Statistical Packages (3 credits)
SYST 101 - Understanding Systems Engineering (3 credits)
SYST 210 - Systems Design (3 credits)
SYST 470 - Human Factors Engineering (3 credits)
Bachelor's/Accelerated Master's Programs

Highly-qualified undergraduates have the opportunity to apply to accelerated master’s degree programs in selected Mason programs of study, listed below by both the applicable bachelor's or master's degrees. Students accepted into an accelerated master’s degree program obtain both a bachelor’s and a master’s degree after satisfactory completion of 144 - 150 credits (number of required credits depends on the degree program).

Programs by Bachelor's Degree

Links in this section will open an in-line window. Access program descriptions directly through the Programs of Study left-hand navigation link, or through the listing of Programs by Master's Degree below.

- Accounting, BS/Accounting, Accelerated MS
- Anthropology, BA/Anthropology, Accelerated MA
- Applied Information Technology, BS/Applied Information Technology, Accelerated MS
- Applied Information Technology, BS/Computer Forensics, Accelerated MS
- Applied Information Technology, BS/Information Security and Assurance, Accelerated MS
- Applied Information Technology, BS/Information Systems, Accelerated MS
- Applied Information Technology, BS/Software Engineering, Accelerated MS
- Applied Information Technology, BS/Telecommunications, Accelerated MS
- Bachelor's Degree (any)/English, Accelerated MA (Linguistics Concentration)
- Bachelor's Degree (any)/Global Affairs, Accelerated MA
- Bachelor's Degree (any)/Interdisciplinary Studies, Accelerated MAIS (Energy and Sustainability Concentration)
- Bachelor's Degree (any)/Interdisciplinary Studies, Accelerated MAIS (Folklore Studies Concentration)
- Biology, BS/Biology, Accelerated MS
- BS (selected)/Operations Research, Accelerated MS
- BS (selected)/Statistical Science, Accelerated MS
- BS (selected)/Systems Engineering, Accelerated MS
- Chemistry, BS/Chemistry, Accelerated MS
- Civil and Infrastructure Engineering, BS/Civil and Infrastructure Engineering, Accelerated MS
- Computer Engineering, BS/Computer Engineering, Accelerated MS
- Computer Science, BS/Computer Science, Accelerated MS
- Computer Science, BS/Information Security and Assurance, Accelerated MS
- Computer Science, BS/Information Systems, Accelerated MS
- Computer Science, BS/Software Engineering, Accelerated MS
- Conflict Analysis and Resolution, BA or BS/Conflict Analysis and Resolution, Accelerated MS
- Economics, BA or BS/Economics, Accelerated MA
- Electrical Engineering, BS/Electrical Engineering, Accelerated MS
- Electrical Engineering, BS/Telecommunications, Accelerated MS
- Government and International Politics, BA/Political Science, Accelerated MA
- Government and International Politics, BA/Public Administration, Accelerated MPA
- History, BA/History, Accelerated MA
- Individualized Study, BIS/Applied Information Technology, Accelerated MS
- Individualized Study, BIS/Telecommunications, Accelerated MS
- Mathematics, BS/Mathematics, Accelerated MS
- Philosophy, BA/Philosophy, Accelerated MA
- Physics, BS/Physics, Accelerated MS
Programs by Master's Degree

Program descriptions on the following links will open in a separate window.

- Accounting, Accelerated MS/Accounting, BS
- Anthropology, Accelerated MA/Anthropology, BA
- Applied Information Technology, Accelerated MS/Individualized Study, BIS
- Applied Information Technology, Accelerated MS/Applied Information Technology, BS
- Arts Management, Accelerated MA/Theater, BA
- Biology, Accelerated MS/Biology, BS
- Chemistry, Accelerated MS/Chemistry, BS
- Civil and Infrastructure Engineering, Accelerated MS/Civil and Infrastructure Engineering, BS
- Computer Engineering, Accelerated MS/Computer Engineering, BS
- Computer Forensics, Accelerated MS/Applied Information Technology, BS
- Computer Science, Accelerated MS/Computer Science, BS
- Conflict Analysis and Resolution, Accelerated MS/Conflict Analysis and Resolution, BA or BS
- Economics, Accelerated MA/Economics, BA or BS
- Electrical Engineering, Accelerated MS/Electrical Engineering, BS
- English, Accelerated MA (Linguistics Concentration)/any Bachelor's Degree
- Global Affairs, Accelerated MA/any Bachelor's Degree
- History, Accelerated MA/History, BA
- Information Security and Assurance, Accelerated MS/Computer Science, BS
- Information Security and Assurance, Accelerated MS/Applied Information Technology, BS
- Information Systems, Accelerated MS/Computer Science, BS
- Information Systems, Accelerated MS/Applied Information Technology, BS
- Interdisciplinary Studies, Accelerated MAIS (Energy and Sustainability Concentration)/any Bachelor's degree
- Interdisciplinary Studies, Accelerated MAIS (Folklore Studies)/any Bachelor's Degree
- Mathematics, Accelerated MS/Mathematics, BS
- Operations Research, Accelerated MS/selected BS degree
- Philosophy, Accelerated MA/Philosophy, BA
- Physics, Accelerated MS/Physics, BS
- Political Science, Accelerated MA/Government and International Politics, BA
- Political Science, Accelerated MA/Public Administration, BS
- Psychology, Accelerated MA (Cognitive and Behavioral Neuroscience Concentration)/Psychology, BA or BS
- Public Administration, Accelerated MPA/Government and International Politics, BA
- Public Administration, Accelerated MPA/Public Administration, BS
- Sociology, Accelerated MA/Sociology, BA
- Software Engineering, Accelerated MS/Computer Science, BS
- Software Engineering, Accelerated MS/Applied Information Technology, BS
- Statistical Science, Accelerated MS/selected BS degree
- Systems Engineering, Accelerated MS/selected BS degree
- Telecommunications, Accelerated MS/Electrical Engineering, BS
- Telecommunications, Accelerated MS/Individualized Study, BIS
- Telecommunications, Accelerated MS/Applied Information Technology, BS
- Telecommunications, Accelerated MS/Systems Engineering, BS
Interdisciplinary Minors

Minors and Interdisciplinary Minors in Humanities and Social Sciences

The College of Humanities and Social Sciences has 59 minors, some of which are offered jointly with other units in the university. Minors require between 15 and 21 credits, and all but 8 of those credits can be used simultaneously to fill other requirements. The college encourages all students to declare a minor, if they can. A minor can complement the major, enhance career preparation, allow students to develop a secondary area of expertise, or give them a chance to explore a passion.

The college offers two types of minors: disciplinary and interdisciplinary. The coursework for disciplinary minors comes mainly from a single discipline. Disciplinary minors are offered by one of the 10 departments in the college.

Interdisciplinary minors require coursework from two or more disciplines and are administered by interdepartmental faculty groups, often including faculty from across the university.

All minors in the college are available to students in any major in the university. For more information, see All about Minors.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Disciplinary minors:

- Arabic Minor
- Anthropology
- American Government
- Art History
- Childhood Studies
- Chinese
- Communication
- Consciousness and Transformation
- Criminology, Law and Society
- Economic Systems Design
- Economics
- Electronic Journalism
- English
- French
- German
- History
- International/Comparative Studies
- Latin
- Neuroscience Minor
- Philosophy
- Psychology
- Public Policy and Management
- Religious Studies
• Russian
• Sociology
• Spanish
• Writing and Rhetoric Minor

Interdisciplinary minors:

• African and African American Studies
• Ancient Mediterranean Art and Archaeology
• Applied Conservation Studies (offered jointly with the College of Science)
• Asia-Pacific Studies
• Classical Studies
• Entrepreneurship Studies
• Film and Media Studies
• Folklore and Mythology
• Global Affairs
• Global Systems
• Immigration Studies
• Islamic Studies
• Japanese Studies
• Judaic Studies
• Latin American Studies
• Leadership
• Legal Studies
• Linguistics
• Middle East Studies
• Multimedia
• Native American and Indigenous Studies
• New Europe
• Nonprofit Studies
• Philosophy and Law
• Political Philosophy
• Science and Society
• Sport and American Culture (offered jointly with the School of Recreation, Health, and Tourism)
• Sport Communication (offered jointly with the School of Recreation, Health, and Tourism)
• Sustainability (offered jointly with the College of Science)
• Teaching English as a Second Language
• Urban and Suburban Studies
• Women and Gender Studies

**Undergraduate Interdisciplinary Minor**

**Entrepreneurship Studies Minor**

**Banner Code:** ENTS

Faculty: Buffardi, Kelly, Petrik, Rogers, Wagner
Entrepreneurship includes not only the familiar definition aligned with business management—growth-oriented, innovative practice associated with creative, sometimes aggressive management—but also definitions involving social change. Entrepreneurs guided by the latter definition are change agents who seize opportunities others miss in order to improve systems, invent and disseminate new approaches, and advance sustainable solutions. The ultimate goal of these social entrepreneurs is the creation of social value and long-term transformation.

Social entrepreneurs are not content just to give a fish or teach how to fish. They will not rest until they have revolutionized the fishing industry. They set out, in short, to change the world or, at least, a small corner of it. A minor in entrepreneurship studies provides a student with both a liberal arts background in entrepreneurship—its sources of creativity and ethical foundations—as well as the skills to implement change.

The program is an interdisciplinary minor offered by the College of Humanities and Social Sciences.

For policies governing all minors, see the Academic Policies chapter of this catalog.

Coursework

Students pursuing this minor must complete 16 credits of coursework with a minimum GPA of 2.00.

One required introductory course (1 credit)

- CHSS 310 - Introduction to Entrepreneurship Credits: 1
  Should be taken early on in the minor.

Two required core courses (6 credits)

- MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise Credits: 3
- PSYC 335 - Psychology of Creativity and Innovation Credits: 3

One elective course (3 credits) in social responsibility and ethics chosen from:

- PHIL 305 - Business Ethics Credits: 3
- NCLC 375 - Special Topics Credits: 1-18 This course may be applied to the requirements when the topic is ethics and leadership.

One elective course (3 credits) chosen from:

Other courses may be used to fulfill this requirement with the prior written approval of the director.

- COMM 320 - Business and Professional Communication Credits: 3
- BULE 302 - Legal Environment of Business Credits: 3
• EVPP 480 - Sustainability in Action Credits: 4
• GOVT 358 - Nonprofit Financial Planning Credits: 4
• NCLC 375 - Special Topics Credits: 1-18 This course may be applied to the requirements when the topic is principles of transformative action.
• PSYC 333 - Industrial and Organizational Psychology Credits: 3
• PSYC 435 - Personnel Training and Development: A Psychological Perspective Credits: 3
• PSYC 467 - The Psychology of Working in Groups and Teams Credits: 3

One internship (3 credits)

Students register for an existing internship course, usually in their major, with the plan of work for the internship approved by the director of the minor.

Students who are currently employed may request that the internship requirement be waived on the basis of their job experience. They will be required to complete instead a 3-credit independent study with the director or another faculty member in which they conduct independent research, apply entrepreneurship principles and practices in an analysis of their work place, and produce a final project.

Total: 16 credits
Green Leaf Programs and Courses

The image designates a "green leaf" course or academic program, one which focuses on learning about sustainability, i.e., meeting our present needs without compromising the ability of future generations to meet their own needs.

For more information, please go to http://sustainabilitystudies.gmu.edu/greenleaf/index.html.

Programs

Green leaf academic programs focus on sustainability, usually including a required set of green leaf courses in order to cover the social, economic and environmental dimensions of sustainability. Each is a vital contributor to Mason's sustainability across the curriculum.

Undergraduate Degrees

- Civil and Infrastructure Engineering, BS
- Health, Fitness, and Recreation Resources, BS: Concentration in Parks and Outdoor Recreation
- Environmental and Sustainability Studies, BA
- Environmental Science, BS
- Global Affairs, BA
- Tourism and Events Management, BS

Undergraduate Minors and Certificates

- Environmental Management Undergraduate Certificate*
- Environmental Policy Minor*
- Global Affairs Minor*
- Sustainability Minor

Graduate Degrees

- Environmental Science and Policy, MS
- Environmental Science and Public Policy, PhD
- Global Affairs, MA*
- Interdisciplinary Studies, MAIS: Concentration in Energy and Sustainability

Graduate Certificates

Environmental Conflict Resolution and Collaboration Graduate Certificate

Environmental Management Graduate Certificate

Sustainability and the Environment Graduate Certificate *

Meets green leaf criteria when options are selected to ensure coverage of “people, planet and prosperity” across the program’s curriculum.
Courses

The green leaf designation recognizes offerings that contribute significantly to students' understanding and practice of sustainability. These offerings extend beyond environmental management, natural resources protection and conservation studies alone to Mason's green leaf curricula comprise both sustainability-focused and sustainability-related courses.

**Sustainability-focused courses** provide valuable grounding in the concepts and principles of sustainability. These courses educate students about how different dimensions of sustainability relate to and support each other in theory and practice. In addition, these courses help equip students with the skills to weave together disparate components of sustainability in addressing complex issues.

**Undergraduate**
- AVT 385 - EcoArt
- BIOL 379 - Ecological Sustainability
- CEIE 401 - Sustainable Land Development
- CONS 410 - Human Dimensions in Conservation
- ECON 105 - Environmental Economics for the Citizen
- ECON 335 - Environmental Economics
- EVPP 322 - Business and Sustainability
- EVPP 335 - People, Plants, and Culture
- EVPP 338 - Ecological Economics
- EVPP 355 - Ecological Engineering and Ecosystem Restoration
- EVPP 361 - Introduction to Environmental Policy
- EVPP 378 - Ecological Sustainability
- EVPP 421 - Marine Conservation
- EVPP 480 - Sustainability in Action
- GOVT 361 - Introduction to Environmental Policy
- GGS 307 - Sustainable Development
- NCLC 210 - Sustainable World
- NCLC 318 - Exploring Virginia's Watersheds
- PRLS 250 - Wilderness Travel and Sustainability
- PRLS 300 - People with Nature
- PRLS 402 - Human Behavior in Natural Environments
- SOCI 320 - Social Structure and Globalization
- TOUR 312 - Ecotourism
- TOUR 340 - Sustainable Tourism
- TOUR 420 - Tourism Planning/Policy

**Graduate**
- CEIE 501 - Sustainable Development
- CEIE 540 - Water Supply and Distribution
- CEIE 751 - Environmental Sustainability and Entrepreneurship
- CEIE 892 - Special Topics in Environmental and Water Resource Systems Engineering
- CONF 702 - Peace Studies
- CONS 665 - Conservation Conflict Resolution
- EVPP 521 - Marine Conservation
- EVPP 525 - Economics of Human/Environment Interactions
- EVPP 620 - Development of U.S. Environmental Policies
- EVPP 622 - Management of Wild Living Resources
- EVPP 626 - Environment and Development in Asia
- EVPP 627 - Environmental Policy in Latin America
- EVPP 628 - Environment and Development in Africa
- EVPP 635 - Environment and Society
- EVPP 642 - Environmental Policy
- GGS 525 - Economics of Human/Environment Interactions
- ITRN 760 - International Environmental Politics
- PRLS 531 - Natural Resources Recreation Planning
- PUAD 642 - Environmental Policy
- TOUR 540 - Sustainable Tourism Management

**Sustainability-related courses** help build knowledge about a component of sustainability or introduce students to sustainability concepts during part of the course. They may complement sustainability-focused courses by providing students with in-depth knowledge of a particular aspect or dimension of sustainability (such as the natural environment) or by providing a focus area (such as renewable energy) for a student’s sustainability studies, or they may broaden students’ understanding of sustainability from within different disciplines.

**Undergraduate**
- NCLC 318 - Exploring Virginia's Watersheds
- PRLS 250 - Wilderness Travel and Sustainability
- PRLS 300 - People with Nature
- PRLS 402 - Human Behavior in Natural Environments
- SOCI 320 - Social Structure and Globalization
- TOUR 312 - Ecotourism
- TOUR 340 - Sustainable Tourism
- TOUR 420 - Tourism Planning/Policy

**Graduate**
- CEIE 501 - Sustainable Development
- CEIE 540 - Water Supply and Distribution
- CEIE 751 - Environmental Sustainability and Entrepreneurship
- CEIE 892 - Special Topics in Environmental and Water Resource Systems Engineering
- CONF 702 - Peace Studies
- CONS 665 - Conservation Conflict Resolution
- EVPP 521 - Marine Conservation
- EVPP 525 - Economics of Human/Environment Interactions
- EVPP 620 - Development of U.S. Environmental Policies
- EVPP 622 - Management of Wild Living Resources
- EVPP 626 - Environment and Development in Asia
- EVPP 627 - Environmental Policy in Latin America
- EVPP 628 - Environment and Development in Africa
- EVPP 635 - Environment and Society
- EVPP 642 - Environmental Policy
- GGS 525 - Economics of Human/Environment Interactions
- ITRN 760 - International Environmental Politics
- PRLS 531 - Natural Resources Recreation Planning
- PUAD 642 - Environmental Policy
- TOUR 540 - Sustainable Tourism Management
• ANTH 370 - Environment and Culture
• CEIE 355 - Environmental Engineering and Science
• CEIE 450 - Environmental Engineering Systems
• CHEM 155 - Introduction to Environmental Chemistry I
• CHEM 156 - Introduction to Environmental Chemistry II
• COMM 399 - Special Topics in Communication - Selected topic: Climate Change
• EVPP 110 - The Ecosphere: An Introduction to Environmental Science I
• EVPP 111 - The Ecosphere: An Introduction to Environmental Science II
• EVPP 201 - Environment and You: Issues for the Twenty-First Century
• EVPP 336 - Human Dimensions of the Environment
• EVPP 337 - Environmental Policy Making in Developing Countries
• GGS 102 - Physical Geography
• GGS 103 - Human Geography
• GGS 121 - Dynamic Atmosphere and Hydrosphere
• GGS 122 - Dynamic Geosphere and Ecosphere
• GGS 302 - Global Environmental Hazards
• GGS 303 - Conservation of Resources and Environment
• GGS 304 - Populations Dimensions of Global Change
• GGS 312 - Physical Climatology
• GGS 314 - Severe and Extreme Weather
• GGS 319 - Air Pollution
• GGS 322 - Issues in Global Change
• GGS 353 - Observations of the Earth and its Climate
• GGS 455 - Environmental Impact Assessment
• GEOL 305 - Environmental Geology
• HNRT 228 - Scientific Thought and Processes II - Selected topics: Watershed Science, Energy & Environment, etc.
• NCLC 220 - Energy and Environment
• PHIL 343 - Topics in Environmental Philosophy
• PHYS 331 - Fundamentals of Renewable Energy
• PHYS 385 - Materials Science with Applications to Renewable Energy
• PHYS 385 - Materials Science with Applications to Renewable Energy
• PRLS 501 - Introduction to Natural Resources Law
• USST 301 - Urban Growth in a Shrinking World
• CEIE 690 - Topics in Civil Engineering - Selected topic: Environmental Sustainability and Entrepreneurship
• COMM 670 - Social Marketing
• COMM 690 - Special Topics in Communication - Selected topic: Climate Change
• EDCI 573 - Teaching Science in the Secondary School
• EDLE 690 - Using Research to Lead School Improvement
• GCH 560 - Environmental Health
• HIST 615 - Problems in American History
Courses

This section lists George Mason University’s undergraduate and graduate courses that are available for credit. For more detailed information on courses, please go to the Course Information section.

**PLEASE NOTE:** The English course prefix has changed from ENGL to ENGH.

**Accounting (ACCT)**

Offered by the School of Management.

If a student takes noncore, upper-level business courses before admission to SOM, those courses will not count on an undergraduate degree application for any major in the school, except as general elective credit. A grade of C or higher must be presented on the graduation application for each upper-level course in the major. Course prerequisites are strictly enforced. Degree status is defined as formal admission to BS degree status in SOM.

**ACCT 203 - Survey of Accounting**

Credits: 3 (NR)

Introduction to accounting from the viewpoint of those who prepare and use financial information. Topics include using accounting information; creating financial statements; an overview of the firm's operating, financing, and investing activities; and an introduction to product costing, operating budgets, and capital investment decisions. Lecture, recitation format; requires attendance in weekly lecture and weekly recitation.

Equivalent to ACCT 204

Prerequisite(s): Grade of C or higher in ECON 103.

Hours of Lecture or Seminar per week: 3

Hours of Lab or Studio per week: 0

When Offered: Fall, Spring, Summer

**ACCT 204 - Honors Survey of Accounting**

Credits: 3 (NR)

Examines the fundamental concepts and principles of financial and managerial accounting from the viewpoint of the users of financial information, with an emphasis on the operating, financing, and investing management decisions that maximize firm value in a global economy.

Students may not receive credit for both ACCT 203 and ACCT 204.

Equivalent to ACCT 203

Prerequisite(s): Cum GPA of 3.5 or higher; ECON 103 with a grade of B or higher. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
ACCT 301 - Financial Accounting and Managerial Decision Making

Credits: 3 (NR)

Examines financial accounting from the viewpoint of both users and preparers of financial statements, emphasizing use of financial statement information to make financing, operating, and investing decisions. International Financial Reporting Standards (IFRS) are introduced. School of Management students will not be permitted to make more than three attempts to achieve a C or higher in ACCT 301. Those who do not successfully complete this course within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the “Termination from the Major” section under Academic Policies.

Prerequisite(s): Grade of C or higher in ACCT 203, sophomore standing.

Notes: Mid-term and final exams may be scheduled on Saturdays for this class. The number of class sessions will be modified to compensate for mid-term examination time. Accommodations will be made for religious conflicts, Saturday classes, and certain official university activities.

ACCT 311 - Managerial and Cost Accounting

Credits: 3 (NR)
Develops skills in identifying business processes, transforming data into useful information, and making managerial decisions. Designed for students in all areas of management, especially those whose career aims include cost management. Topics include analyzing and managing costs, developing cost systems that facilitate decision making, identifying opportunities for improving business process, creating financial and operating budgets for planning and control, and developing measures to assess performance.

Prerequisite(s): Degree status, grade of B minus or higher in ACCT 301. Prerequisite enforced by registration system.

Notes: Mid-term and final exams may be scheduled on Saturdays for this class. The number of class sessions will be modified to compensate for mid-term examination time. Accommodations will be made for religious conflicts, Saturday classes, and certain official university activities.

ACCT 331 - Intermediate Financial Accounting I

Credits: 3 (NR)
Credits: 3 (NR)
Deals with the accounting process used to measure and report economic events. The primary goals are to understand the role financial reporting plays in providing decision-useful information; understand the economics underlying business transactions and learn the generally accepted accounting principles (GAAP) that set the reporting and disclosure requirements for those transactions; evaluate the efficacy of GAAP; and understand the motivations that lead managers to select one accounting principle over another. Topics include the accounting process and the conceptual framework, financial statements, and accounting for current and noncurrent assets and liabilities. International Financial Reporting Standards (IFRS) are discussed.

**Prerequisite(s):** Degree status, grade of B minus or higher in ACCT 301. Prerequisite enforced by registration system.

**Notes:** Mid-term and final exams may be scheduled on Saturdays for this class. The number of class sessions will be modified to compensate for mid-term examination time. Accommodations will be made for religious conflicts, Saturday classes, and certain official university activities.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**ACCT 332 - Intermediate Financial Accounting II**

Credits: 3 (NR)
Deals with the accounting process used to measure and report economic events. The primary goals are to understand the role financial reporting plays in providing decision-useful information; understand the economics underlying business transactions and learn the generally accepted accounting principles (GAAP) that set the reporting and disclosure requirements for those transactions; evaluate the efficacy of GAAP; and understand the motivations that lead managers to select one accounting principle over another. Topics include bonds, owners' equity, cash flows, accounting changes, and accounting for investments, income taxes, leases, and pensions. International Financial Reporting Standards (IFRS) are discussed.

**Prerequisite(s):** Degree status, grades of C or higher in ACCT 331 and FNAN 301. Prerequisite enforced by registration system.

**Notes:** This course is a continuation of ACCT 331.

**Mid-term and final exams may be scheduled on Saturdays for this class. The number of class sessions will be modified to compensate for mid-term examination time. Accommodations will be made for religious conflicts, Saturday classes, and certain official university activities.**

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**ACCT 351 - Taxation and Managerial Decision Making**

Credits: 3 (NR)
Introduction to fundamental topics in taxation using a business-entities approach. Specific topics include gross income, deductions, losses, and property transactions. The course emphasizes the identification of planning and compliance issues and the application of tax law to resolve those issues. Both tax and non-tax factors affecting decision making are considered.

**Prerequisite(s):** Degree status, grade of C or higher in ACCT 331. Prerequisite enforced by registration system.
Notes: Mid-term and final exams may be scheduled on Saturdays for this class. The number of class sessions will be modified to compensate for mid-term examination time. Accommodations will be made for religious conflicts, Saturday classes, and certain official university activities.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring  

ACCT 361 - Accounting Information Systems

Credits: 3 (NR)  
Introduction to accounting information systems, focusing on a conceptual basis for transaction processing. Handling and processing of transactions in revenue, expenditure, and payroll cycles serves as platform for developing and manipulating accounting information within a computerized transaction-processing and electronic data environment.

Prerequisite(s): Degree status, grade of B minus or higher in ACCT 301. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring  

ACCT 372 - Business Analysis and Valuation

Credits: 3 (NR)  
Expands on students' ability to use financial statement information for business valuation and financial analysis transactions including credit analysis, risk assessment, risk management, bankruptcy prediction, and equity valuation. Uses actual case studies to provide in-depth analysis of the use of financial statement information.

Prerequisite(s): Degree status, grade of C or higher in ACCT 331. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring  

ACCT 411 - Advanced Managerial Accounting

Credits: 3 (NR)  
Managerial uses of accounting information in planning, controlling, motivating, and decision making. Emphasizes quantitative and behavioral aspects of managerial accounting.

Prerequisite(s): Degree status, grade of C or higher in ACCT 311. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring
**ACCT 433 - Advanced Financial Accounting**

Credits: 3 (NR)

**Prerequisite(s):** C or higher in ACCT 332, degree status. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**ACCT 451 - Advanced Federal Taxation**

Credits: 3 (NR)
Federal taxation of corporations, partnerships, fiduciaries, and gratuitous transfers.

**Prerequisite(s):** Degree status, grade of C or higher in ACCT 351. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**ACCT 461 - Assurance and Audit Services**

Credits: 3 (NR)
Introduction to audit and other assurance services’ objectives, theory, and practices. Focuses on developing skills for interpreting business strategies and identifying related business risks, describing internal control solutions to those risks, identifying evidential sources, providing assurance about those risks and controls, and designing strategies to provide assurance services about the reliability of business information.

**Prerequisite(s):** Degree status, grades of C or higher in ACCT 331 and 361. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**ACCT 462 - Honors Seminar in Accounting**

Credits: 3 (NR)
An in-depth study and analysis of contemporary developments and topics of interest in accounting.

**Prerequisite(s):** Accounting major, senior standing, permission of the instructor.
Notes: The topics and format will vary. Enrollment in this course is limited and competitive.

**ACCT 472 - Government and Not-for-Profit Accounting**

Credits: 3 (NR)
Introduction to accounting for nonbusiness organizations. Emphasizes accounting issues unique to these entities, including non-exchange transactions and lack of ownership interest. Includes accounting and reporting for state and local governments, charitable organizations, and the federal government.

Prerequisite(s): Degree status, grade of C or higher in ACCT 331. Prerequisite enforced by registration system.

**ACCT 491 - Seminar in Accounting**

Credits: 3 (NR)
Advanced study of accounting concepts and selected topics.

Prerequisite(s): Degree status, 'C' or higher in ACCT 331. Prerequisite enforced by registration system.

**ACCT 492 - Field Experience in Accounting**

Credits: 3 (NR)
Opportunity to gain practical, professional experience in conjunction with academic development. Internship is an important part of academic and career preparation.

Prerequisite(s): Degree Status.

Notes: Crosslisted with SOM 492 and is intended for accounting students. May be used as elective credit, but may not be repeated.
ACCT 499 - Independent Study

Credits: 1-3 (RT)
Research and analysis of selected problems or topics in accounting.

Prerequisite(s): 9 credits in upper-level accounting courses, degree status.

Notes: Must be arranged with an instructor, and students must receive written approval from the associate dean for undergraduate programs before registration. Written report required. May be repeated for maximum 6 credits if topics vary.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

ACCT 611 - Advanced Managerial Accounting

Credits: 3 (NR)
This course will examine the firm's planning and control decisions that require a more sophisticated approach than the rule-of-thumb procedures advocated for traditional cost accounting problems. Students will work with issues and problems that have arisen in practice and then develop the relevant management accounting treatment by applying the appropriate management accounting analytical model.

Prerequisite(s): Admission to the MSA program or permission of the program director. ACCT 311 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

ACCT 651 - Advanced Taxation

Credits: 3 (NR)
This course covers the application of the federal income tax law to C-corporations, S-corporations, and partnerships. Students will read and apply primary tax authorities to client fact patterns. Topics will include the formation, operations, and dissolutions of such entities. Students will conduct engage in significant professional research and writing.

Prerequisite(s): Admission to the MSA program or permission of the program director. ACCT 351 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ACCT 672 - Governmental and Nonprofit Accounting

Credits: 3 (NR)
Accounting and Reporting for non-business organizations. Emphasizes accounting issues unique to these entities, including non-exchange transactions and lack of ownership interest. Includes accounting and reporting for state and local governments, nongovernment organizations, and the federal government.
Prerequisite(s): Admission to the MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ACCT 690 - Professional Accounting Colloquium

Credits: 3 (NR)
The professional accounting colloquium is designed to give graduate accounting students the opportunity to learn about contemporary accounting issues currently facing the profession by attending presentations, workshops, etc., given by professionals of the day. The presentations will be conducted by academic researchers, regulators, executives, etc., on topics typically not found in a traditional accounting textbook.

Prerequisite(s): Admission to the MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special.
When Offered: Fall, Spring

ACCT 692 - Seminar in Accounting

Credits: 3 (NR)
This course provides selective analysis of current accounting topics addressing important issues in contemporary accounting practice.

Prerequisite(s): Admission to the MS Accounting program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ACCT 701 - Business Valuation

Credits: 3 (NR)
Provides hands-on-experience in financial statement analysis and valuation. Class takes an accounting-based valuation perspective. Offers a comprehensive framework for analyzing financial statements consisting of (a) Business Strategy, (b) Accounting Analysis, (c) Financial Analysis, and (d) Prospective Analysis and Valuation.

Prerequisite(s): Admission to the MSA program or permission of instructor. "B" or better in MBA 613.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ACCT 708 - Taxes and Business Strategy

Credits: 3 (NR)
Provides a framework for making managerial decisions in a global tax environment. Examines business decisions such as location of facilities, employee compensation, mergers and acquisitions, capital and asset structure, and business form. Focuses on tax planning concepts and the effect of taxes on business decisions.

Prerequisite(s): Admission to the MSA program or permission of instructor. Completion of MBA core requirements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ACCT 741 - Information Technology Auditing

Credits: 3 (NR)
Introduces methodologies to assess security and control issues concerning accounting and other information systems. Key feature of course is applying computer-assisted audit tools and techniques to test effectiveness of application controls.

Equivalent to MBA 741

Prerequisite(s): Admission to MSA or MBA program, or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ACCT 742 - Corporate Governance and Ethics

Credits: 3 (NR)
Focuses on developing understanding of corporate governance issues and ethical decision making. Topics include examination of internal and external international governance issues, and ethical analysis in current business environment.

Equivalent to MBA 742

Prerequisite(s): Admission to MSA or MBA program, or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

ACCT 743 - Corporate Financial Reporting

Credits: 3 (NR)
Addresses contemporary issues in corporate financial reporting. Focuses on role of financial reporting in providing decision-useful information to participants of capital market, and theoretical and empirical assessments of its performance.
ACCT 744 - Fraud Deterrence and Detection

Credits: 3 (NR)
Introduces strategies and techniques for fraud prevention and detection. Focuses on financial fraud such as bribery, contract rigging and kickbacks, embezzlement, fraudulent financial reporting, payroll fraud, and misappropriation of inventory and other assets.

Equivalent to MBA 744

Prerequisite(s): Admission to MSA or MBA program, or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ACCT 745 - International Financial Reporting

Credits: 3 (NR)
Examines accounting from an international perspective, including the study of various functional areas of accounting across countries and the reporting requirements encountered by companies engaged in international trade and making foreign direct investments.

Equivalent to MBA 745

Prerequisite(s): Completion of MBA or MSA core requirements, or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ACCT 792 - Seminar in Accounting

Credits: 3 (RT)
Selective analysis of current accounting topics addressing important issues in contemporary accounting practice. Discussion of two or three major topics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ACCT 795 - Global Accounting Environment

Credits: 3 (NR)
This course will examine the activities of accounting firms competing in the global business environment. Students will observe these activities in residency, studying the decision making processes of international accounting firms, and at the same time, develop an understanding of the regulatory environment of global accounting.

Prerequisite(s): Admission to the MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer

ACCT 796 - Independent Studies/Directed Readings

Credits: 1-3 (NR)
Research and analysis of selected problems or topics in accounting not otherwise available in curriculum.

Prerequisite(s): Permission of Program Director.

Notes: Approval of faculty member and program director required. May be repeated for up to 3 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

Adult Education (EDAL)

Offered by the College of Education and Human Development

EDAL 542 - Arranging Conditions for Adult Learning

Credits: 6 (NR)
Focuses on linking adult learners to resources and establishing the environment for learning. Covers program development processes, teaching and learning strategies for adults, technology and adult learning, workplace learning, and learning organizations.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

African and African American Studies (AFAM)

Offered by the College of Humanities and Social Sciences
AFAM 200 - Introduction to African American Studies

Credits: 3 (NR)
Interdisciplinary introduction to the field of African American studies. Includes comparative analysis of approaches, methodologies, and key concepts related to the study of people of African descent in the United States, continental Africa, and throughout the African diaspora. Lectures and discussion integrate attention to such issues as diversity and multiculturalism from national and global perspectives.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AFAM 390 - Special Topics in African and African American Studies

Credits: 3 (RT)
Study of selected topics related to the study of people of African descent in Africa, the United States, the Caribbean, Latin Americas and throughout the African Diaspora.

Notes: May be repeated for a maximum of 12 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AFAM 490 - Internship

Credits: 2-6 (NR)
Approved work-study program in cooperation with specific organizations including area museums, NGOs, and local, state and federal agencies. Students should arrange for an internship in the semester before they wish to enroll. Requires approval of department.

Prerequisite(s): AFAM 200 and 60 credits.

Notes: Credit to be determined by the African American Studies Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AFAM 499 - Independent Study

Credits: 1-3 (NR)
Investigation of an area related to African American studies according to individual interest, with emphasis on research.

Prerequisite(s): Permission required from program director, Dr. Wendi Manuel-Scott.
Anthropology (ANTH)

Offered by the College of Humanities and Social Sciences

ANTH 114 - Introduction to Cultural Anthropology

Credits: 3 (NR)
Overview of major ideas and approaches to the study of cultures around the world. Surveys kinship, social organization, political economy, religious beliefs, language and other aspects of non-Western cultures.

Fulfills general education requirement in social and behavioral science.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 120 - Unearthing the Past: Prehistory, Culture and Evolution

Credits: 3 (NR)
Introduction to archeology and bioanthropology. Explore issues and debates in human biological evolution, prehistory and social change, as well as lab and field methods for understanding archaeological remains

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ANTH 135 - Becoming Human: Evolution, Cognition, and Culture

Credits: 3 (NR)
Examines fossil evidence for human evolution, the origins of human cognition, and human culture. Explores contemporary issues and debates in human biological and social evolution.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ANTH 299 - Independent Study

Credits: 1-3 (NR)
Individual study in anthropology on topic organized in advance by student and instructor.

Prerequisite(s): ANTH 114, or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

ANTH 300 - Civilizations

Credits: 3 (NR)
Cross-cultural and transtemporal examination of complex societies and civilizations. Explores developmental schema for rise, articulation, spread, and decline of historic and contemporary civilizations.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 301 - Native North Americans

Credits: 3 (NR)
Exploration of native North American cultures and selected aspects of Indian-white historical relations. Emphasizes cultural persistence as well as change.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 302 - Peoples and Cultures of Latin America

Credits: 3 (NR)
Examines Latin American cultures and selected aspects of historical record.

Fulfills general education requirement in global understanding.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ANTH 304 - Peoples and Cultures of the Pacific

Credits: 3 (NR)
Survey of 20th-century Melanesian, Polynesian, and Micronesian cultures. Case studies of interplay between cultural systems and island ecology.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 305 - Foraging Societies

Credits: 3 (NR)
Examines early human societies with emphasis on environmental, technological, and cultural aspects of hunting and gathering as a successful means of adaptation.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 306 - Peoples and Cultures of Island Asia

Credits: 3 (NR)
Examines cultures of the Island Asia culture region, focusing on native cultures of Indonesia, Borneo, and the Philippines.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 307 - Ancient Mesoamerica

Credits: 3 (NR)
Examines the peoples and cultures of ancient Mesoamerica, including Olmec, Maya, Teotihuacan, and Aztec societies. Major topics include the rise of civilization, the development of the Mesoamerican cultural tradition, the growth of cities, trade, exchange, writing systems, political organization, religion, conflict, and the archaeological study of this indigenous heritage.

Fulfills general education requirement in global understanding.

Prerequisite(s): ANTH 120, 60 credits, or permission of instructor.
Notes: Fulfills the college requirement in non-Western culture.

**ANTH 308 - Peoples and Cultures of the Middle East**

Credits: 3 (NR)
Examines the anthropological literature on peoples and cultures of the Middle East, with particular attention to political and social change over the course of the 20th century.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ANTH 309 - Peoples and Cultures of India**

Credits: 3 (NR)
Examination of South Asia, with emphasis on India. Includes general overview of prehistory and history; impact of colonialism; contemporary Indian culture, including the changing relations of caste and class, family organization, and the roles of women, religion, and ideology; and current trends in economic development and socioeconomic differences in different parts of the country.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ANTH 310 - Social Organization and Kinship**

Credits: 3 (NR)
Examines social organization, kinship, descent, and kinship terminologies in mainly non-Western cultures, emphasizing the meaning of specific cultural systems and cross-cultural similarities and differences.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ANTH 311 - Peoples and Cultures of Mainland Southeast Asia**
ANTH 312 - Political Anthropology

Credits: 3 (NR)
Examines cultural and ecological contexts of political structures and competition for power in selected societies; and cross-cultural and comparative approaches to study of political conflict, leadership, values, and symbolism.

Fulfills general education requirement in global understanding.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 313 - Myth, Magic, and Mind

Credits: 3 (NR)
Examines religion as a cultural system. Topics include mythology, ritual, symbolism, and dogma. Emphasizes cross-cultural and predominantly non-Western material.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 314 - Zombies

Credits: 3 (NR)
Explores how human beings across cultures have historically expressed social anxieties through references to the one particular manifestation of the undead: zombies, figures representing a state in which human beings are animate and affective in the world around them, but lack consciousness or free will.

Notes: Fulfills the college requirement in non-Western culture.
**ANTH 315 - Socialization Processes: Family, Childhood, Personality in Cross-Cultural Perspective**

Credits: 3 (NR)
Examines aspects of the cultural transmission process in specific local cultures selected from various world culture regions, with emphasis on transmission of cultures.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor.

**ANTH 316 - Peoples and Cultures of the Caribbean**

Credits: 3 (NR)
Examines the social, cultural, and political history of the Caribbean Sea islands and coastal Central and South American lowlands that collectively constitute the geographic and cultural region known as the Caribbean. Emphasizes the central role this region has historically played in creating a sense of global interconnectedness among diverse regions of the world.

Fulfills general education requirement in global understanding.

**ANTH 322 - Pirates, Conquest, and Death: Archaeology and Globalism since 1500**

Credits: 3 (NR)
Examines materials, theories, and methods of archaeology derived from and applied to historical sites, as they complement archival records.

Prerequisite(s): ANTH 120, 60 credits, or permission of instructor.

**ANTH 323 - Digging and Dealing in the Dead: Ethics in Archaeology**

Credits: 3 (NR)
Survey of the ethical and legal dimensions of conducting archaeological research. Examines historical and contemporary debates about the responsibilities archaeologists have to the communities they study. Explores appropriate methods of artifact preservation, excavation, and the interpretation of data.
Notes: Fulfills the college requirement in non-Western culture.

**ANTH 324 - Warfare, Violence, and Sacrifice in Antiquity**

Credits: 3 (NR)
Examines origin and nature of conflict in human society with an emphasis on the ancient past. Major topics include the possible role of violence in human evolution, cross-cultural studies of conflict in indigenous society, warfare in early states, and sacrifice as a ritual practice.

**Prerequisite(s):** ANTH 120, 60 credits, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ANTH 325 - Field Techniques in Archaeology**

Credits: 3-6 (RT)
Intensive study of archaeological field techniques by directed group projects in site survey, site testing, recording techniques, and stratigraphy through discussions, demonstrations, and hands-on experience.

**Prerequisite(s):** ANTH 120, 60 credits, or permission of instructor.

**Notes:** May be repeated for a maximum 6 credits.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

**ANTH 330 - Peoples and Cultures of Selected Regions: Non-Western**

Credits: 3 (NR)
Examines cultures of a specific region such as Africa and the Middle East. Focuses primarily on non-Western cultures.

**Prerequisite(s):** ANTH 114, 60 credits, or permission of instructor.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ANTH 331 - Refugees**
Credits: 3 (NR)
Introduction to causes and consequences of forced dislocation as a global issue. Covers formally recognized refugees, as well as people such as internally displaced persons and asylum seekers who are in refugee-like circumstances. Focuses on understanding the personal experiences of refugees, and examining efforts on their behalf at national and international levels.

Fulfills general education requirement in global understanding.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 332 - Cross-cultural perspectives on globalization

Credits: 3 (NR)
Examines the varieties of cultural experience. Several cultures are studied in depth, with attention to local histories, global contexts, and shifting perspectives on the practice of ethnography.

Fulfills general education requirement in global understanding.

Notes: May be used for credit toward the BA in sociology. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 340 - Comparative Perspectives on Immigration

Credits: 3 (NR)
Considers the dimensions and meanings of the immigrant experience in the United States, with a focus on the diversity of immigrants and refugees who have arrived during the past 30 years. Emphasis on the social context in which immigration occurs and on the bearing of institutional and cultural influences on patterns of adaptation, assimilation, and exclusion from the host society.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 360 - Evolution, Sex, and Society

Credits: 3 (NR)
Inquiry into the biological dimensions of humans as culture-bearing animals. Topics include altruism, aggression, primate social organization, morphology, comparative ethnology, and microevolutionary genetic differentiation.

Prerequisite(s): ANTH 135, 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ANTH 365 - Race and Racism

Credits: 3 (NR)
Examines biological dimensions of human variation and the beginnings of race as a concept. Discusses evolution of human biodiversity in culturally distinct human groups related to environment, physiology, genetics, nutrition, and disease. Explores use of scientific analyses of human biodiversity.

Prerequisite(s): ANTH 135, 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 370 - Environment and Culture

Credits: 3 (NR)
Examines relationships among environment, culture, and human behavior with an emphasis on cultural ecological explanations in mainly non-Western contexts.
Designated a Green Leaf Course.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 371 - Psychological Anthropology

Credits: 3 (NR)
Survey of issues in the study of relationships between cultural and psychological variables. Major topics viewed cross-culturally include personality, mental illness, projective systems, cognition, and learning.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 375 - Culture, Power, History

Credits: 3 (NR)
Use of ethnographic, archaeological, linguistic, and documentary data, in light of anthropological theory, to interpret the past and processes of change among indigenous peoples throughout the world.
ANTH 380 - Language and Culture

Credits: 3 (NR)
Anthropological analyses of language behavior, origins, and change. Emphasizes the interplay of language, culture, anthropology, and linguistics.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor.

ANTH 381 - Medical Anthropology

Credits: 3 (NR)
Surveys the discipline of medical anthropology, focusing on traditional medical beliefs and the diverse responses to modern scientific medicine in developing countries and among cultural minorities in the United States.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

ANTH 382 - Urban Anthropology

Credits: 3 (NR)
Uses tools and resources of social and cultural anthropology to study life in cities, including urban poverty, migration, urban planning, and discrimination. Case studies draw from different urban environments around the world, including Washington, D.C., and New York City.

Prerequisite(s): ANTH 114 and 60 credits, or permission of instructor.

ANTH 385 - Gender, Class, and Ethnicity in Latin America

Credits: 3 (NR)
Examines the bases for gender differences and similarities across a variety of societies and cultures in Latin America. Examines interrelationships among constructions of gender, class, and ethnicity.
Fulfills general education requirement in global understanding.

**ANTH 390 - Theories, Methods, and Issues I**

Credits: 3 (NR)
First of a two-course sequence that reviews the major theoretical traditions and schools of thought in anthropology.

**Prerequisite(s):** ANTH 114 and 60 credits, or permission of instructor.

**Notes:** Required for anthropology majors.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**ANTH 395 - Work, Technology, and Society: An IT Perspective**

Credits: 3 (NR)
Introduction to the anthropology of work, technology, and society, with emphasis on information technology. Covers general conceptual issues of information technology and also involves specific practical exercises with computers, their operating systems, the logic of automated production, databases, and web-based communication. Attention also directed to social and ethical issues raised by contemporary information technology.

Fulfills general education requirement in information technology (all).

**Prerequisite(s):** ANTH 114, 60 credits, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**ANTH 396 - Issues in Anthropology: Social Sciences**

Credits: 3 (RT)
Topic of contemporary interest in anthropology, focusing on social science topics of interest.

Fulfills general education requirement in social and behavioral science.

**Notes:** May be repeated for a maximum of 18 credits when topic is different. Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall, Spring, Summer
ANTH 398 - Study Abroad

Credits: 1-6 (RD)
Field project or study abroad experience leading to the production of a written report

Notes: May be repeated with permission of department for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ANTH 399 - Issues in Anthropology

Credits: 3 (RT)
Topic of contemporary interest in anthropology, changing from semester to semester, and focusing on topics such as sex roles, anthropology and ethics, and primate social organization.

Prerequisite(s): ANTH 114 and 60 credits, or permission of instructor.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 400 - Engaging the World: Anthropological Perspectives

Credits: 3 (RT)
Examines selected topics with emphasis on the integration of different kinds of knowledge and the balancing of alternative ways of assessing meaning and relevance. Topics usually drawn from issues of global economic processes, civic rights and responsibilities, ethics, museums, public policy, the environment, and migration.

Fulfills general education requirement in synthesis.

Prerequisite(s): ANTH 114, 60 credits, completion of all general education requirements, or permission of instructor.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 410 - Research Design and Methods in Bioanthropology

Credits: 3 (NR)
Research design in bioanthropology and archaeology. Topics include critique of case studies, framing problems, field strategies,
measuring variables, sampling, analysis, and interpretation of results.

Prerequisite(s): 60 credits and 6 credits of anthropology, including ANTH 120 or 135; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 420 - Interpretation in Archaeology

Credits: 3 (NR)
Explores theoretical and methodological issues in archaeology. Considers patterns and contexts of archaeological remains, analytic problems, and interpretation of material culture.

Prerequisite(s): 6 credits of anthropology including ANTH 120, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 425 - Public Archaeology

Credits: 3 (NR)
Considers public significance of archaeology and anthropological contributions to public concerns such as antiquities legislation and cultural resource management.

Prerequisite(s): 6 credits of anthropology including ANTH 120, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 427 - Historic Cemetery Survey

Credits: 4 (NR)
Explores demographic, stylistic, and religious aspects of historic cemeteries. Students learn to survey, record, and analyze gravestone data through field projects.

Prerequisite(s): ANTH 120, or permission of instructor.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

ANTH 428 - Patterns in Prehistory

Credits: 3 (NR)
Explores diversity of prehistoric cultures in light of major cultural development: hunting-gathering, agriculture, pastoralism, and
complex societies.

Prerequisite(s): 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ANTH 430 - Research Methods in Archaeology**

Credits: 3 (NR)  
Studies archaeological research process through discussions of current archaeological methodologies and student participation in designing and critiquing research projects.

Prerequisite(s): ANTH 120, 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ANTH 435 - Special Projects: Archaeology and Biological Anthropology**

Credits: 1-3 (NR)  
Lab or field project leading to a written report of the research.

Prerequisite(s): ANTH 120 or 135, 60 credits, and permission of instructor.

Notes: Research and paper completed under instructor's guidance.

Hours of Lecture or Seminar per week: 1-12  
Hours of Lab or Studio per week: 0

**ANTH 436 - Special Projects: Archaeology and Biological Anthropology**

Credits: 1-3 (NR)  
Lab or field project leading to a written report of the research.

Prerequisite(s): ANTH 120 or 135, 60 credits, and permission of instructor.

Notes: Research and paper completed under instructor's guidance.

Hours of Lecture or Seminar per week: 3-6  
Hours of Lab or Studio per week: 0

**ANTH 440 - Public Anthropology: Seeking Solutions in the Public and Private Sectors**
Credits: 3 (NR)
Focuses on anthropologists' contributions to major policy issues in development agencies in the United States and abroad. Covers techniques that lead to prevention or management of social and cultural conflict.

Prerequisite(s): ANTH 114, 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 450 - Qualitative Methods: Nonstatistical Approaches in Culture and Social Research

Credits: 3 (NR)
Explores some of the most useful nonquantitative research techniques in social sciences and offers practice in their application.

Prerequisite(s): 60 credits and 6 credits of anthropology including ANTH 114, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 488 - Gender, Sexuality, and Culture

Credits: 3 (NR)
Examines how gender, sexuality, race, and class come together as analytically distinct, yet practically intertwined, systems of meaning and practice. Examples highlight questions of political economy and history while focusing on specific ethnographic or historical readings.

Prerequisite(s): 60 hours and ANTH 340 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 490 - Theories, Methods, and Issues II

Credits: 3 (NR)
Second of a two-course sequence that reviews major theoretical traditions and schools of thought in anthropology.

Fulfills writing intensive requirement in the major.

Prerequisite(s): 60 hours and 9 hours of ANTH, including ANTH 390, or permission of instructor.

Notes: Required for anthropology majors and usually taken as a senior seminar.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ANTH 492 - Contemporary Controversies in Anthropology

Credits: 3 (NR)
Examines recent important works, issues, and controversies in anthropology.

Prerequisite(s): 60 credits and 9 credits of anthropology including ANTH 390, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 495 - Internship

Credits: 1-6 (RD)
Supervised project in applying anthropology in relevant settings including public and historical archaeology, developmental anthropology, museums, non-profit organizations, advocacy, communications, or consulting organizations.

Prerequisite(s): 60 credits or permission of instructor.

Notes: May be repeated for a maximum of 6 credits. Students must complete 45 hours of work at the internship site for each credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

ANTH 496 - On Evolution

Credits: 4 (NR)
Considers evolution as biological as well as cultural concept. Parallels and contrasts among conceptual approaches allow a critique of the potential of evolution as a unifying biosocial theory.

Prerequisite(s): 60 credits and 9 credits of anthropology, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

ANTH 499 - Independent Research

Credits: 1-12 (RT)
Individual research on a topic to be organized in advance by student and instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

ANTH 535 - Anthropology and the Human Condition: Seminar I
Credits: 3 (NR)
Examines some of the major theorists of 19th- and early 20th-century cultural theory. Marx, Freud, Durkheim, and Weber are surveyed as foundational thinkers for reading the works of such 20th-century theorists as Boas, Malinowski, Benedict, and Sapir.

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 536 - Anthropology and the Human Condition: Seminar II

Credits: 3 (NR)
Examines contemporary theorists of anthropology, covering ongoing debates over epistemology and the multiple strands that inform anthropological theory and practice.

Prerequisite(s): ANTH 535.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 555 - Policy and Culture

Credits: 3 (NR)
Examines the relevance of cultural processes to policymaking and the culture of policymaking organizations. Topics include development, welfare policy, environmental and energy policy, regulation and risk; health care and immigration policy; and the war on drugs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 568 - Human Origins

Credits: 3 (NR)
Detailed survey of the genetic, morphological, and behavioral origins of hominids. Discusses current interpretations and debates.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 576 - American Cultures

Credits: 3 (NR)
Examines U.S. cultures and explores concept of an American culture. Course readings and discussions explore underpinnings of
the American experience, document broad historical shifts, and detail the experience of diverse groups of Americans, thus forming the basis for a critical, analytical, and comparative discussion of American life and life in America.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ANTH 580 - Evolution and Human Ecology**

Credits: 3 (NR)
Examines complex relationships among human cultures, biocultural adaptation, and the natural world from an evolutionary perspective.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ANTH 600 - Anthropology and Museums**

Credits: 3 (NR)
Explores the changing relations between culture, indigenous groups, representation and knowledge by examining how meaning is created and conveyed in museums and exhibits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

**ANTH 610 - Social Organization**

Credits: 3 (NR)
Detailed examination and re-evaluation of the basic concepts of kinship and social organization in light of contemporary anthropological concerns. Several classical and contemporary texts develop key issues of social organization. Review of traditional concepts of classical anthropology introduces discussion of the nature of the broad epistemological shift that occurred in the last quarter of the 20th century.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ANTH 614 - Ethnopsychology: Self, Subject, and Culture**
Credits: 3 (NR)
The emerging field of ethnopsychology, in Catherine Lutz's words, is "concerned with the way in which people conceptualize, monitor, and discuss their own and other's mental and/or behavioral processes." Course examines roots of the ethnopsychological enterprise, reviews several recent approaches to the description and analysis of folk psychological material, and investigates the relationship between folk psychology and other aspects of social life.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

ANTH 615 - Ritual and Power in Social Life

Credits: 3 (NR)
Domains of religion and politics are conjoined by questions of power: its deployment, distribution, and forms of resistance it engenders. Drawing on a variety of theoretical orientations in the social sciences, including structuralism, semiotics, psychoanalysis, and performance theory, course investigates connections among religious thought, ritual practice, and political action.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 617 - Political Economy

Credits: 3 (NR)
Human societies have always engaged in complex political relations and economic exchanges. The cultural meanings people create are shaped by, and in turn shape, systems of power. Political economy is the attempt to understand the relationship between politics and economics, at the juncture of local meanings and global histories. Course reviews major works and models of political economy, especially as they relate to social and cultural analysis.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 620 - Theory: Archaeology and Biological Anthropology

Credits: 3 (NR)
Examines theoretical approaches in archaeology, paleoanthropology, and biological anthropology.

Prerequisite(s): Course in archaeology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ANTH 625 - Research Design and Methods in Archaeology and Biological Anthropology

Credits: 3 (NR)
Examines research strategies and methods in archaeology, paleoanthropology, and biological anthropology.

Prerequisite(s): Course in archaeology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 631 - Refugees in the Contemporary World

Credits: 3 (NR)
Explores major refugee flows since the mid-20th century, emphasizing mechanisms for providing assistance, asylum, and resettlement.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 632 - International Migration in Comparative Perspective

Credits: 3 (NR)
International migration in the contemporary world, focusing on the full range of economic, political, and social reasons for migration and the effects of different national policies on that process.

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 635 - Regional Ethnography

Credits: 3 (RD)
In-depth study of peoples and cultures of a specific world region (Latin America, East Asia, the Pacific, or United States). Content may include cultures defined by diaspora, migration, and other global forces and processes.

Prerequisite(s): Graduate standing, or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ANTH 640 - Applied Anthropology

Credits: 3 (NR)
Explores the application of contemporary anthropological ideas, theories, and methods to find solutions to practical problems as defined by various organizations and institutions including business, government, nongovernmental organizations, and various institutions.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 645 - Ethnography and Literature

Credits: 3 (NR)
Explores relations between ethnography and literature. Most anthropological knowledge is transmitted in written form through texts known as "ethnographies." Ethnographic techniques can be used in novels, travel literature, biography, and autobiography. Course explores these uses, alongside anthropological ethnographies, to arrive at a better understanding of ethnography: what constitutes it and how it is defined and practiced.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 650 - Ethnographic Methods and Research Design

Credits: 3 (NR)
Reviews and examines major research methods commonly employed in cultural anthropological field study, with emphasis on ethnographic research design and the use of standard ethnographic techniques. Includes practice in designing ethnographic research project and using ethnographic methods and techniques in a field setting.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ANTH 655 - Nationalism, Transnationalism, and States: Local and Global Perspectives

Credits: 3 (NR)
Explores different approaches to understanding the interaction of nationalism, transnationalism, and states given the apparently simultaneous dissolution of demographic, economic and cultural borders, and modernist social science paradigms.

Prerequisite(s): Graduate standing, or permission of instructor.
ANTH 660 - Social Science and Critical Theory

Credits: 3 (NR)
Surveys key ideas of the Frankfurt School and its legacies today, including the critique of ideology; aesthetic theory; instrumental rationality; and analyses of the state, culture, and society. Writings by members of the Frankfurt School draw on many philosophical and methodological strands: radical humanism, Marxist analysis, cultural criticism, psychoanalysis, and political sociology.

Prerequisite(s): Graduate standing, or permission of instructor.

ANTH 670 - Regional Studies in Archaeology

Credits: 3 (NR)
Regional survey of specific culture area in archaeology to be chosen by student and instructor.

Prerequisite(s): Permission of instructor.

ANTH 675 - Laboratory Techniques

Credits: 4 (NR)
Covers techniques of data collection, analysis, and management in archaeology and biological anthropology.

Prerequisite(s): Course in archaeology, and permission of instructor.

ANTH 677 - Anthropology and History

Credits: 3 (NR)
Considers anthropological approaches to the study of history, the ways in which people construct their histories, and social historians' effort to incorporate anthropological and ethnographic orientations into their accounts. Attention to tensions between culture and power in the constitution of historiography and to methodological challenges of interpreting qualitative and quantitative data.
Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

ANTH 680 - Readings in Archaeology

Credits: 3 (NR)
Directed readings and research on a specific topic in archaeology to be chosen by student and instructor.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

ANTH 682 - Readings in Biological Anthropology

Credits: 3 (NR)
Directed readings and research on a specific topic in biological anthropology chosen by student and instructor.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

ANTH 684 - Independent Study in Sociocultural Anthropology

Credits: 1-6 (RD)
Directed reading and research on a specific topic, agreed on by student and faculty member, resulting in a written project.

Notes: May be repeated for maximum of 6 credits.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
Grading: Graduate Special

ANTH 685 - Language and Culture
Credits: 3 (NR)
Survey of research on the relationship between language and culture, and the many ways the study of language has enhanced understanding of the nature of culture. Course material drawn from anthropology's four traditional subdisciplines (cultural, linguistic, prehistoric archaeology, and physical), as well as neighboring fields such as sociolinguistics, psycholinguistics, literary theory, and ethnology.

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ANTH 687 - Medical Anthropology**

Credits: 3 (NR)
Explores the wide variety of cultural interpretations of health, illness, and curing. Examines a number of different curing systems, both traditional and modern, and compares them with cosmopolitan biomedicine. Several book-length case studies cover a wide variety of cultural groups, health topics, and theoretical orientations.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ANTH 690 - Internship**

Credits: 3-6 (RT)
All internships must be approved by faculty advisor to ensure suitability to the student's course of study. Introduction to applied anthropology through approved work and study at a museum, institute, agency, or other approved site.

Prerequisite(s): Graduate standing in anthropology with 3 credits of methods and 12 credits in program, or with permission of primary advisor.

Notes: May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

**ANTH 699 - Contemporary Issues in Sociocultural Anthropology**

Credits: 3 (RT)
Explores current issues and debates in sociocultural anthropology.

Prerequisite(s): Graduate standing, or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.
ANTH 710 - Contemporary Issues in Archaeology and Biological Anthropology

Credits: 3 (NR)
Contemporary research developments and the ways in which various scientific disciplines and theoretical approaches are integrated in the study of biocultural evolution, adaptation, and diversity.

Prerequisite(s): ANTH 620 and 625, completion of 24 graduate credits, and approval of graduate advisor.

ANTH 721 - Culture, Power, and Conflict

Credits: 3 (NR)
Explores power and social conflict through the lens of cultural analysis. Special attention to the role of cultural differences in the structuring of conflict and the deployment of cultural theory in formulating a practice of conflict resolution.

Prerequisite(s): Graduate standing, or permission of instructor.

ANTH 750 - Ethnographic Genres

Credits: 3 (NR)
"Genre" refers to kind, sort, or type. Course surveys the various modes of representation anthropologists use in elaborating participant-observation field work, as well as how these styles refer to and construct ethnographic "others." Explores a set of central philosophical and methodological issues in social-cultural anthropology such as framing, perspective, authority, reflexivity, and politics of style.

Prerequisite(s): Graduate standing, or permission of instructor.

ANTH 769 - Gender, Sexuality, and Culture

Credits: 3 (NR)
Utilizes interdisciplinary material within an overall anthropological perspective on body meanings and practices. Readings highlight questions of political economy and history, focusing on specific ethnographic or historical contexts, to develop an understanding of how gender, sexuality, race, and class become analytically distinct yet intertwined systems of meaning and
practice.

**Prerequisite(s):** Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ANTH 796 - Master's Research Project**

Credits: 1-6 (RD)  
Capstone research project conducted under the supervision of a faculty project director and project evaluation committee. Project should be a substantial contribution to anthropological knowledge and is in lieu of a thesis.

**Prerequisite(s):** Approval of project proposal.

**Notes:** Students must initially enroll for a minimum of 3 credits of ANTH 796 and maintain continuous enrollment in 796 until project is submitted. A maximum of 6 credits of ANTH 796 may be applied to the degree.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No credit only

**ANTH 797 - Anthropology Colloquium/Workshop**

Credits: 0 (RD)  
Public forum for the presentation and discussion of contemporary anthropological research.

**Prerequisite(s):** Admission to graduate program in anthropology or permission of graduate director.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**ANTH 798 - Thesis Proposal**

Credits: 1-6 (RD)  
Work on research proposal that forms basis for master's thesis.

**Prerequisite(s):** Completion of 18 credits, including all core courses.

**Hours of Lecture or Seminar per week:** 3-6  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No credit only  
**When Offered:** Fall, Spring, Summer

**ANTH 799 - Master's Thesis**
Credits: 1-6 (RD)
Master's thesis research and writing under direction of thesis committee.

Prerequisite(s): Approval of thesis proposal.

Notes: Students must register for a minimum of three credit hours in their first semester of 799 and maintain continuous enrollment in 799 while writing and submitting a thesis. A maximum of 6 credits of 799 may be applied to the degree.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0
Grading: S/NC

Applied Information Technology (AIT)

Offered by the Volgenau School of Engineering

AIT 500 - Quantitative Foundations for Information Systems Analysis

Credits: 3 (NR)
Provides common background in basic quantitative areas focused on decision making, information processing, and telecommunications. Topics include review of precalculus, introduction to matrix algebra, problems in optimization, and introduction to probability and statistics.

Prerequisite(s): MATH 108 or equivalent

Notes: Does not fulfill any VSITE graduate degree requirement.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AIT 504 - Issues of Cyberspace

Credits: 3 (NR)
This seminar-style course presents students, grouped into panels, with major and novel problems presented by the explosive and intrusive growth of 'cyberspace.' Student panels explore, report on, and make recommendations regarding facets of these issues. Facets include legal, ethical, financial, security, utility and value to users and organizations, feasibility and desirability. Each semester features a major topic area.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AIT 521 - Software Engineering Essentials
Credits: 3 (NR)
Provides an overview of essential topics in software engineering, including problem solving with computers, requirements, software design, software development, testing, verification, validation, usability, and management. Discuss concepts related to building software, including data structures, object-oriented programming, event handling in GUIs, and web application technologies and how these concepts are handled in various languages, but without requiring the students to program.

Equivalent to SWE 521

Prerequisite(s): Graduate standing.

Notes: This course does not count towards MS programs offered in the Computer Science Department and cannot be used to satisfy course requirements for PhD IT students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**AIT 524 - Database Management Essentials**

Credits: 3 (NR)
Relational database management systems. Covers logical and physical database design; query languages and database programming; and examines commercial systems. Computing lab.

Equivalent to INFS 524

Prerequisite(s): Graduate Standing in MS, AIT program or permission of instructor.

Notes: This course does not count towards MS programs offered in the Computer Science Department and cannot be used to satisfy course requirements for PhD IT students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**AIT 590 - Topics in Applied Information Technology**

Credits: 3 (RT)
Topics in the application of information technology. The topics are chosen in such a way that they do not duplicate existing AIT courses. Students are expected to participate actively through class dialogues and the crafting of IT solutions to specific problem areas. Course cannot be used to satisfy course requirements for PhD IT students.

Prerequisite(s): Graduate standing and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer
AIT 597 - Developing IT Leaders of Integrity

Credits: 3 (NR)
Introduces students to the practice of leading with integrity. Through selected readings, discussions, team projects, in-class activities and guests, students identify their core values, study the attributes of effective and toxic leaders and, examine the difference between managing and leading. Students practice and receive in-class coaching to hone their leadership skills. Considers the cultural and organizational influences and focuses on leadership's ethical dimensions.

Prerequisite(s): Registered student in MS, Applied IT or by Instructor's permission.

Notes: Course cannot be used to satisfy course requirements for PhD IT students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AIT 665 - Managing Information Technology Programs in the Federal Sector

Credits: 3 (NR)
This case study-grounded seminar introduces student team members to the unique complexities of the Federal Sector, including Congressional and Executive Branch oversight, reporting, justifying and sustaining annually very large IT programs. Course cannot be used to satisfy course requirements for PhD IT students.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring


Credits: 3 (NR)
This course offers a survey of security and privacy issues in Cloud Computing systems, along with an overview of current solutions and available technologies. In this course, we examine cloud computing models, look into the threat model and security issues related to data and computation outsourcing, and explore practical applications of secure Cloud Computing.

Prerequisite(s): Restricted to MS, Applied IT program majors or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

AIT 671 - Information System Infrastructure Lifecycle Management

Credits: 3 (NR)
Course examines information system infrastructure lifecycle management including the audit process, IT governance and best
practices, system and infrastructure control, IT service delivery and support, protection of information assets, physical security, business and disaster recovery.

Prerequisite(s): Registration in MS, Applied IT program or permission of Instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

AIT 672 - Identity Management for Federal IT

Credits: 3 (NR)
This course provides a hands-on in-depth description of the principles, concepts, and technology of Identity Management. Topics to be covered in this course include the digital identity, credentials, authentication, authentication protocols, trust frameworks, cryptography and digital signatures, identity tokens (smart cards) and smart card based identity verification and authorization applications.

Prerequisite(s): Admission into MS AIT program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AIT 673 - Cyber Incident Handling and Response

Credits: 3 (NR)
Course examines Computer Emergency Response Team (CERT), including Incident Response, Vulnerability Assessment, Incident Analysis, Malcode Analysis, Forensics and Investigations. It offers exercises in CERT operations and a final Incident Handling project.

Prerequisite(s): AIT 670 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AIT 675 - Overview of the National Intelligence Community

Credits: 3 (NR)
Introduces structure and basic operations of the U.S. national intelligence community (IC). Students learn general information about organization, structure and missions of the IC and about the tools and techniques employed by intelligence agencies of the U.S. and other intelligence services. Surveys the range of intelligence problems and challenges. types of data and data collectors employed and how disseminated.

Prerequisite(s): Admission into the MS-AIT degree program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**AIT 676 - The Intelligence Cycle**

Credits: 3 (NR)
Present the necessary cycle of intelligence activities, to include requirements definition, tasking of assets, collection and the methods to do so, processing, analysis, exploitation, and ultimate dissemination to policy makers and military users. Discusses technologies from the standpoint of what is required to accomplish the necessary activities of the cycle.

**Prerequisite(s):** Admission into the MS-AIT degree program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**AIT 677 - Intelligence Analysis Methods**

Credits: 3 (NR)
Present various intelligence analysis methods addressing basic topics: substance-blind analysis of evidence and its credentials, chain of custody analysis, combination of evidence, divide and conquer paradigm for analysis, sources of uncertainty, competing hypotheses and analyses. Discusses case studies in various domains following a hands-on approach using educational analysis tools.

**Prerequisite(s):** Admission into the MS-AIT degree program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**AIT 678 - Intelligence Problems and Challenges**

Credits: 3 (NR)
Present the process by which decision makers identify and prioritize intelligence problems and allocate collection and analysis resources to their solutions. Discusses nation-state issues such as Russia, China, and Iran, and transnational issues such as terrorism, weapons proliferation, narcotics and smuggling, and cyber conflict and the intelligence shortcomings and needs in regard to these problems.

**Prerequisite(s):** Admission into the MS-AIT degree program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**AIT 685 - Capstone Seminar**
This seminar is a student team-based experience grounded on a solid understanding of the coursework mastered in each of the program's three areas of study. Teams analyze business cases, facilitated by area faculty, of systems of system programs, "mega-systems", of the 20th century. Course cannot be used to satisfy course requirements for PhD IT students.

**Prerequisite(s):** Second Year standing in the MS, Applied IT Program; Permission of Instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

### AIT 690 - Advanced Topics in Applied Information Technology

Credits: 3 (RT)  
Advanced topics in the application of information technology. The topics are chosen in such a way that they do not duplicate existing AIT courses. Students are expected to participate actively through class dialogues and the crafting of IT solutions to specific problem areas. Course cannot be used to satisfy course requirements for PhD IT students.

**Prerequisite(s):** Graduate standing & permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

### AIT 697 - Leading Organizations Through Change

Credits: 3 (NR)  
Introduces students who understand fundamentals of unit leadership to the critical tools for leading organizations through sustainable change. Through selected readings, discussions, team projects, in-class activities and guests, students learn how to prepare the organization, plan the details, execute a change process across an organization and measure the plan’s effectiveness and the change it brings to achieve continuous improvement. Students practice and receive in-class coaching to hone their leadership skills.

**Prerequisite(s):** Graduate Standing in MS, AIT program or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

### AIT 701 - Cyber Security: Emerging Threats and Countermeasures

Credits: 3 (NR)  
The course covers security issues and current best practices in several applicative domains, ranging from the enterprise to the military. The course discusses emerging security threats and available countermeasures with respect to the most recent network and computing technologies, including wireless networks, computer-controlled physical systems, and social networks. The course concludes presenting current trends and open problems.
Arabic (ARAB)

Offered by the College of Humanities and Social Sciences

ARAB 101 - Introduction to the Arabic Language

Credits: 3 (NR)

Introduction to Arabic language, dialects, countries, and culture. Beginning modern standard and classical Arabic, with emphasis on the written language, script and phonology. Basic grammar covering gender, numbers, cases, prepositions, nominal sentences, and basic conversation and greetings.

Notes: Students may not receive credit for ARAB 101 and ARAB 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 102 - Introduction to the Arabic Language

Credits: 3 (NR)

Introduction to developing reading skills in formal settings. Emphasizes modern standard Arabic in oral communication. Beginning grammar level focuses on verbal sentences, present tenses, questions, and compound nouns.

Prerequisite(s): ARAB 101.

Notes: Students may not receive credit for ARAB 102 and ARAB 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 110 - Elementary Arabic

Credits: 6 (NR)

Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.
Notes: Students may not receive credit for ARAB 110 and ARAB 101 or ARAB 102.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

ARAB 201 - Intermediate Arabic I

Credits: 3 (NR)
Further development of listening, speaking, reading, and writing skills. Advanced level of vocabulary. Grammar covers past tenses, subordinated conjunctions, and introduction to passive voice.

Prerequisite(s): ARAB 101, 102.

Notes: Also introduces Arabic dictionary. Students may not receive credit for ARAB 201 and ARAB 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 202 - Intermediate Arabic II

Credits: 3 (NR)
Emphasis on application of language skills to reading, composition, and discussion. Focuses on language structure, format of developing vocabulary from verbs, covering different derivations, and language patterns. Leads to learning the use of Arabic dictionary in depth. Grammar covers passive voice and verbal nouns.

Prerequisite(s): ARAB 201

Notes: Students may not receive credit for ARAB 202 and ARAB 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 210 - Intermediate Arabic

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Arabic-speaking regions.

Prerequisite(s): ARAB 110 or appropriate placement score.

Notes: Students may not receive credit for ARAB 210 and ARAB 201 or ARAB 202.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ARAB 250 - Gateway to Advanced Arabic

Credits: 3 (NR)
Integration of advanced intermediate-level Arabic reading, writing, listening, and speaking skills and the development of critical thinking and understanding authentic texts from the Arabic world.

Prerequisite(s): ARAB 210, appropriate placement score, or permission of department.

Notes: Taught in Arabic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 325 - Major Arab Writers/Stories

Credits: 3 (RD)
Studies works of major Arab writers or collections such as The Arabian Nights.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or permission of instructor

Notes: Taught in English. Knowledge of Arabic helpful but not required. May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 330 - Reading and Conversation I

Credits: 3 (NR)
Development of conversational fluency and reading skills in modern standard Arabic through class discussion, reports, and presentations. Includes readings from newspapers, journals, magazines, web sites, literary works, and other sources.

Prerequisite(s): ARAB 250, appropriate placement score, or permission of instructor.

Notes: Taught in Arabic. ARAB 330 and 331 must be taken in sequence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 331 - Reading and Conversation II

Credits: 3 (NR)
Continuation of ARAB 330.
Prerequisite(s): ARAB 250 (or equivalent), appropriate placement score, or permission of instructor.

Notes: Taught in Arabic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 350 - Media Arabic I (Written Media)

Credits: 3 (NR)
Develops advanced reading skills through work with current written media in Arabic.

Prerequisite(s): ARAB 330 and 331 or appropriate placement score or permission of instructor.

Notes: Taught in Arabic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 351 - Media Arabic II (Spoken Media)

Credits: 3 (NR)
Develops advanced listening and speaking skills through work with current broadcasts in Arabic TV and Radio.

Prerequisite(s): ARAB 350 or permission of instructor.

Notes: Taught in Arabic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 380 - Arabic Dialects

Credits: 3 (RT)
Study of the structure of one Arabic dialect with comparison to Modern Standard Arabic and the classical Fus-ha. Includes study of literature, proverbs, and culture associated with that dialect.

Prerequisite(s): ARAB 250 or appropriate placement score.

Notes: Taught in Arabic. May be repeated for a maximum of 6 credits when dialect covered is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 390 - Translation Methods: Arabic to English
Credits: 3 (NR)
Provides students with essential tools and techniques to translate Arabic texts to English. Includes practice applying these
techniques to a variety of documents including literary, media, and legal texts.

Prerequisite(s): ARAB 330 and 331 or appropriate placement score or permission of instructor.

Notes: Taught in Arabic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 420 - Survey of Arabic Literature

Credits: 3 (NR)
A survey of Arabic literature from its genesis to the present day.

Prerequisite(s): Six credits of 300 level courses taught in Arabic or permission of instructor.

Notes: Taught in Arabic. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 430 - Advanced Arabic Grammar

Credits: 3 (NR)
Introduction to traditional Arabic grammar. Covers parts of speech, sentence structure, case marking, and verb structure.
Combines traditional with modern approaches to Arabic grammar and includes practical drills.

Prerequisite(s): Six credits of 300 level courses taught in Arabic or permission of instructor.

Notes: Taught in Arabic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARAB 440 - Topics in Arabic Religious Thought and Texts

Credits: 3 (RD)
Survey of the religious and intellectual heritage of the Arab world.

Prerequisite(s): Six credits of 300 level Arabic or permission of instructor.

Notes: Taught in Arabic. May be repeated for a maximum of 9 credits when topic and texts are different. Fulfills the college
requirement in non-Western culture.
Art History (ARTH)

Offered by the College of Humanities and Social Sciences

Students taking ARTH courses should expect to participate in field trips or assignments outside the classroom at area museums.

At least one 400- or 500-level course is offered each semester; each topic area is generally offered every two years.

ARTH 101 - Introduction to the Visual Arts

Credits: 3 (NR)
Introduction to the content and principles of the visual arts. Approach varies with instructor.

Fulfills general education requirement in arts.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 102 - Symbols and Stories in Art

Credits: 3 (NR)
Themes and imagery in art from early Greece to the modern era.

Fulfills general education requirement in arts.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 103 - Introduction to Architecture

Credits: 3 (NR)
Introduces study, principle, and understanding of art of architecture. Approach varies with instructor; may be historical, geographical, technical, or thematic.

Fulfills general education requirement in arts.

Notes: Field trips required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ARTH 150 - Freshman Seminar

Credits: 3 (NR)
Focuses on skills and methods of learning as well as subject matter as a way of introducing the discipline of art history.

Notes: Topics vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 200 - Survey of Western Art

Credits: 3 (NR)
Major periods, monuments, and themes of Western art and architecture. Introduces Washington, D.C., museum collections and a historical framework for further study in art history. Covers prehistory, the ancient world, and the Middle Ages.

Fulfills general education requirement in arts.

Notes: Designed as a two-course sequence, but each part may be taken independently without prerequisite.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 201 - Survey of Western Art

Credits: 3 (NR)
Major periods, monuments, and themes of Western art and architecture. Introduces Washington, D.C., museum collections and a historical framework for further study in art history. Covers the art of the Renaissance, the baroque period, and modern Europe and the Americas.

Fulfills general education requirement in arts.

Notes: Designed as a two-course sequence, but each part may be taken independently without prerequisite.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 203 - Survey of Asian Art

Credits: 3 (NR)
Introduces the arts of South, Southeast, and east Asia. Examines aspects of the culture and history of Asia. Discusses monuments and artifacts in a variety of media and their relation to social and historical contexts.

Fulfills general education requirement in arts.

Notes: Fulfills the college requirement in non-Western culture.
ARTH 204 - Survey of Latin American Art

Credits: 3 (NR)
Introduces arts of Latin America from pre-Columbian to modern era. Discusses important examples of painting, sculpture, and architecture in relation to culture and history of region.

Fulfills general education requirement in arts.

Notes: Fulfills the college requirement in non-Western culture.

ARTH 303 - National Traditions

Credits: 1-3 (RT)
Studies traditions of art and architecture within a single selected country or historical region.

Prerequisite(s): 24 credits or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

ARTH 311 - Design of Cities

Credits: 3 (RD)
Explores problems in urban design in a particular geographical region or historical period. Approach varies with instructor, and may involve archaeological or theoretical approaches appropriate to the specific context.

Prerequisite(s): 24 credits.

Notes: May be repeated for a maximum of 6 credits when topic if different.

ARTH 315 - Modern Architecture
Credits: 3 (NR)
Studies in modern architecture from the Beaux Arts movement to the present; an investigation of stylistic, structural, or theoretical innovations.

Prerequisite(s): 24 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 319 - Art and Archaeology of the Ancient Near East

Credits: 3 (NR)
Aspects of the art, archaeology, and culture of ancient Near East and Bronze Age Mediterranean. Approach varies depending on instructor; emphasis may be on Mesopotamia, Iran, Egypt, Anatolia, the Levant, or the Aegean.

Fulfills general education requirement in global understanding.

Prerequisite(s): 24 credits.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 320 - Art of the Islamic World

Credits: 3 (NR)
Introduction to Islamic art, from the time of Muhammad to present. Cultural and regional approach, utilizing local museum collections.

Fulfills general education requirement in global understanding.

Prerequisite(s): 24 credits.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 321 - Greek Art and Archaeology

Credits: 3 (NR)
History of ancient Greek architecture, sculpture, and painting.

Fulfills general education requirement in arts.

Prerequisite(s): Completion of 24 credits.
**ARTH 322 - Roman Art and Archaeology**

Credits: 3 (NR)
History of Roman architecture, sculpture, and painting.

Fulfills general education requirement in arts.

**Prerequisite(s):** 24 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ARTH 324 - From Alexander the Great to Cleopatra: The Hellenistic World**

Credits: 3 (NR)
Arts of the Hellenistic age within the context of history and culture of the period. Explores the powerful dynasties ruling wealthy empires; achievements in learning and literature housed in the Great Library at Alexandria; baroque sculpture adorning the Altar of Zeus at Pergamon; and Roman collectors of Greek art and antiques.

Fulfills general education requirement in arts.

**Prerequisite(s):** 24 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ARTH 333 - Early Christian and Byzantine Art**

Credits: 3 (NR)
Aspects of medieval art and culture in eastern Mediterranean world. Topics may include late antiquity, early Christianity, and the Byzantine empire and its neighbors. Designed to take advantage of unique local museum resources.

Fulfills general education requirement in arts.

**Prerequisite(s):** 24 credits.

**Notes:** Specific focus varies with instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
**ARTH 334 - Western Medieval Art**

Credits: 3 (NR)
Aspects of art and architecture in medieval Europe, from the fall of the Roman Empire through the Gothic period.

Fulfills general education requirement in arts.

**Prerequisite(s):** 24 credits.

**Notes:** May be repeated for a maximum of 6 credits when topic is different.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**ARTH 335 - Arts of Medieval England**

Credits: 3 (NR)
Explores aspects of the art, architecture, and archeology of medieval England. Special emphasis may be placed on Cultural contexts and literary sources.

Fulfills general education requirement in arts.

**Prerequisite(s):** 24 credits.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**ARTH 340 - Early Renaissance Art in Italy, 1300-1500**

Credits: 3 (NR)
Studies in architecture, sculpture, and painting in the age of Giotto, Ghiberti, Masaccio, and Botticelli.

Fulfills general education requirement in arts.

**Prerequisite(s):** 24 credits.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**ARTH 341 - Northern Renaissance Art**

Credits: 3 (NR)
Studies in the art of France, Germany, and the Netherlands in the age of Van Eyck and Dürer.

Fulfills general education requirement in arts.
Prerequisite(s): 24 credits

**ARTH 342 - High Renaissance Art in Italy, 1480–1570**

Credits: 3 (NR)

Studies in architecture, sculpture, and painting in the age of Leonardo, Michelangelo, Raphael, and Titian.

Fulfills general education requirement in arts.

Prerequisite(s): 24 credits.

**ARTH 344 - Baroque Art in Italy, France, and Spain, 1600–1750**

Credits: 3 (NR)

Studies in architecture, sculpture, and painting in the age of Caravaggio, Bernini, Velazquez, and Poussin.

Fulfills general education requirement in arts.

Prerequisite(s): 24 credits.

**ARTH 345 - Northern Baroque Art, 1600-1750**

Credits: 3 (NR)

Studies in architecture, sculpture, and painting in the age of Rubens, Van Dyck, Rembrandt, and Vermeer.

Fulfills general education requirement in arts.

Prerequisite(s): 24 credits.

**ARTH 350 - History of Photography**
Credits: 3 (NR)
Development of photography from origins in France in the 19th century to the present.

Prerequisite(s): 24 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 359 - Art of the 18th and 19th Centuries**

Credits: 3 (RD)
Introduction to the art and architecture of the 18th and 19th centuries. Topics focus on specific art forms, media, geographic regions, or the thematic categories.

Prerequisite(s): 24 credits.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 360 - Nineteenth-Century European Art**

Credits: 3 (NR)
Movements from neoclassicism to symbolism discussed in relation to social, cultural, political, and technological changes in Europe.

Fulfills general education requirement in arts.

Prerequisite(s): 24 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 362 - Twentieth-Century European Art**

Credits: 3 (NR)
Study of major movements (fauvism, cubism, futurism, constructivism, surrealism, and expressionism) and important artists in 20th-century painting and sculpture.

Fulfills general education requirement in arts.

Notes: Focus may vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ARTH 371 - American Architecture and Material Culture

Credits: 3 (NR)
Studies in the history of American architecture or decorative arts in cultural context. Topics range from 17th century to 20th century, depending on instructor.

Prerequisite(s): 24 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 372 - Studies in 18th- and 19th-Century Art of the United States

Credits: 3 (RD)
Developments in visual culture and the changing status of art practitioners throughout these periods. Focus is either chronological (Colonial Period, Gilded Age) or thematic (19th-century genre scenes, the American landscape and national identity).

Fulfills general education requirement in arts.

Prerequisite(s): 24 credits.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 373 - Studies in 20th-Century Art of the United States

Credits: 3 (RD)
Developments in 20th-century American visual culture across all media.

Fulfills general education requirement in arts.

Prerequisite(s): 24 credits

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 374 - Art Now
Credits: 3 (NR)
Explores visual art production since 1980, drawing on regional resources. Examines social, institutional, and political issues in recent art and its markets.

Prerequisite(s): Any course in art history or art studio, or permission of instructor.

Notes: Requires students to work collaboratively and make several field trips, including one Saturday bus trip to New York. Specific topics and assignments vary with the changing art season and instructor. Lecture, discussion.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 376 - Twentieth-Century Latin American Art**

Credits: 3 (NR)
Major movements and important artists in 20th-century Latin American art discussed in relation to social, cultural, and political conditions in the region.

Fulfills general education requirement in arts.

Prerequisite(s): 24 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 380 - African Art**

Credits: 3 (NR)
Focuses on sub-Saharan African art in terms of styles and aesthetics; materials and techniques; and geographical, social, cultural, and religious contexts. Specific focus of course may vary with instructor.

Fulfills general education requirement in global understanding.

Prerequisite(s): 24 credits.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 382 - Arts of India**

Credits: 3 (NR)
History, culture, and arts of south Asia from earliest civilizations along the Indus River to onset of Western colonialism. Emphasizes role of material evidence in the creation of the South Asian history and how political, social, and religious developments affected the arts. Discusses monuments and artifacts in a variety of media in relation to historical contexts.
Fulfills general education requirement in global understanding.

**Prerequisite(s):** 24 credits.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ARTH 383 - Arts of Southeast Asia**

Credits: 3 (NR)
Examines various cultural and artistic traditions of ancient Southeast Asia, from the earliest archaeological evidence to onset of colonialism. Lectures and discussions focus on material culture of the great civilizations that arose within borders of modern Thailand, Cambodia, Indonesia, Burma (Myanmar), Vietnam, Laos, and Malaysia.

Fulfills general education requirement in global understanding.

**Prerequisite(s):** 24 credits.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ARTH 384 - Arts of China**

Credits: 3 (NR)
Explores the complex and dynamic history of China by examining ways in which social, religious, and political shifts have given rise to new and variant forms of material culture.

Fulfills general education requirement in global understanding.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ARTH 385 - Arts of Japan**

Credits: 3 (NR)
Art and architecture of Japan, with particular attention to the ways political changes, religious movements, and social developments influenced and shaped those creations. Discusses monuments and artifacts in a variety of media in relation to social and historical contexts.

Fulfills general education requirement in global understanding.
Prerequisite(s): 24 credits.

Notes: Fulfills the college requirement in non-Western culture.

ARITH 386 - The Silk Road

Credits: 3 (NR)
Explores luxury arts and material culture of Eurasian trade routes between Mediterranean and China in historical, religious, and social contexts. Emphasizes cultural interactions in medieval Central Asia.

Fulfills general education requirement in global understanding.

Prerequisite(s): 24 credits.

Notes: Fulfills the college requirement in non-Western culture.

ARITH 393 - Art History Internships

Credits: 3-6 (RD)
Internship with a professional arts institution, organization, or individual in the Washington, D.C., area. Project to be arranged by student in consultation with faculty instructor and field supervisor.

Prerequisite(s): Art history major or minor, and permission of instructor.

Notes: Strongly recommended for advanced art history students seeking exposure to professional work in visual arts. May be taken for 3 to 6 credits, or repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

ARITH 394 - The Museum

Credits: 3 (NR)
Examines history, theory, practice, ethics, and current problems of collecting and displaying art and artifacts to the public. Emphasizes issues central to museums in Washington, D.C., or museums in other locations; focus varies with instructor.

Fulfills general education requirement in synthesis.

Prerequisite(s): 6 credits in art history at the 300-level, and completion or concurrent enrollment in all other required general education courses.
ARTH 398 - Study Abroad in the History of Art

Credits: 1-6 (RT)
Study abroad. Course topics, content, and locations vary.

Notes: A maximum of 6 credits may be applied to the major or minor with permission of the program.

ARTH 399 - Special Topics in the History of Art

Credits: 3 (RT)
Topics vary.

Notes: May be repeated when topic is different.

ARTH 400 - Historiography and Methods of Research in Art History

Credits: 3 (NR)
Historical investigation of theories, methods, and critiques involved in the discipline of art history. Approach or focus may vary with instructor.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ENGL 302/ENGH 302, and 6 credits in art history at the 300 level; or permission of instructor.

Notes: May be repeated for credit.

ARTH 420 - Advanced Studies in Ancient Art

Credits: 3 (RT)
Studies a particular area of ancient art of the Mediterranean, Near East, or Middle East. Topics may be art form or medium, geographical area, theme, function, or context.
Fulfills writing intensive requirement in the major.

Prerequisite(s): ENGL 302/ENGH 302 and 6 credits in Art History at the 300 level, or permission of instructor.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 430 - Advanced Studies in Medieval or Islamic Art

Credits: 3 (RT)
Studies a single topic in medieval or Islamic art. May focus on a particular period, region, or medium, or may explore cultural interconnections within medieval Eurasian world.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ENGL 302/ENGH 302, and a 300-level course in medieval or Islamic art; or permission of instructor.

Notes: May be repeated for a maximum of 12 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 440 - Advanced Studies in Renaissance and Baroque Art

Credits: 3 (RT)
Studies a particular aspect of Renaissance or baroque art. Topics may be monographic, thematic, or concentrated on the art of a smaller time period or a particular area.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ENGL 302/ENGH 302 and 6 credits in Art History at the 300 level, or permission of instructor.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ARTH 460 - Advanced Studies in 20th-Century European Art

Credits: 3 (RT)
Study of a particular topic in 20th century European art. Course may focus on a specific period, region, movement, medium, or theoretical issue, or explore cultural connections and transfer between regions.

Fulfills writing intensive requirement in the major.
Prerequisite(s): ENGL 302/ENGH 302 and 300-level course in the art of 19th- or 20th-century Europe or the Americas; or permission of instructor.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 471 - Advanced Studies in Art of the United States**

Credits: 3 (NR)
Studies a particular area of American art, focusing on a form, such as landscape or genre painting; theme, such as nationalism, regionalism, or iconography of the family; or movement, such as American modernism.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ENGL 302/ENGH 302 and 300-level course in American art

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 472 - Advanced Studies in 20th-Century Latin American Art**

Credits: 3 (RD)
Study of a particular topic in 20th-century Latin American art. Course may focus on a specific period, region, movement, medium, or theoretical issue, or explore cultural connections and transfer between regions.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ENGL 302/ENGH 302 and 300 level course in 19th- or 20th-century art of Europe or the Americas, or permission of the instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 474 - Advanced Studies in Contemporary Art**

Credits: 3 (RD)
Study of a topic in contemporary art in a research seminar setting. Focus on particular theme, region, artist, or medium, or take a comparative approach.

Fulfills writing intensive requirement in the major.
Prerequisite(s): ENGL 302/ENGH 302 and 300-level course work in modern or contemporary art, or permission of the instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 482 - Advanced Studies in Asian Art**

Credits: 3 (RT)
Seminar-style discussions on a specific topic in Asian art. May focus on the art of a particular period, movement, reign, or region, as well as theoretical issues or works in a particular medium.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ENGL 302/ENGH 302, and 300-level course in any area of Asian art; or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 490 - Independent Study in Art History**

Credits: 3 (NR)
Intensive study of a particular artist, period, or theoretical problem to be conducted by an individual student in consultation with instructor.

Fulfills writing intensive requirement in the major.

Prerequisite(s): 60 credits, ENGH 302, permission of instructor and chair, plus 9 credits in art history beyond ARTH 200, 201. Study proposal submitted prior to registration.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 491 - Independent Study in Art History**

Credits: 3 (NR)
Intensive study of a particular artist, period, or theoretical problem to be conducted by an individual student in consultation with instructor.

Fulfills writing intensive requirement in the major.

Prerequisite(s): 60 credits, ENGH 302, permission of instructor and chair, plus 9 credits in art history beyond ARTH 200, 201.
Study proposal submitted prior to registration.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ARTH 492 - Honors Directed Readings, Honors Directed Research**

Credits: 3 (NR)  
Linked individualized courses, usually given by same instructor. Involves directed readings.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** Admission to Art History Honors Program, ENGH 302, permission of instructor and chair, departmental approval of Honors Proposal submitted term prior to registration.

**Notes:** Students must have completed at least one course in the field, or with the professor, chosen for these honors courses. The 3 credits of readings should be taken before the 3 research credits, or they may be taken concurrently.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ARTH 493 - Honors Directed Readings, Honors Directed Research**

Credits: 3 (NR)  
Linked individualized courses, usually given by same instructor. Culminates in research paper related to subject of readings.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** Admission to Art History Honors Program, ENGH 302, permission of instructor and chair.

**Notes:** Students must have completed at least one course in the field, or with the professor, chosen for these honors courses. The 3 credits of readings should be taken before the 3 research credits, or they may be taken concurrently.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

**ARTH 499 - Advanced Studies in Art History**

Credits: 3 (RD)  
Seminar-style discussion on specific subjects in art history.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** ENGL 302/ENGH 302 and 300-level course, or permission of instructor.

**Notes:** May be repeated for a maximum of 6 credits when topic is different.
**ARTH 570 - Proseminar in History of Decorative Arts**

Credits: 3 (NR)
A writing-intensive course designed to equip students with the skills required for professional scholarship in the history of decorative arts. Examines a variety of theories and methods for analyzing objects. Teaches visual and contextual analysis skills as well as critical thinking about and documentation of primary and secondary sources.

**ARTH 571 - Survey of Decorative Arts I**

Credits: 3 (NR)
Overview of European decorative arts from fifteenth to eighteenth centuries, with focus on objects from Italy, France, and England. Examines the role of decorative arts in the formation of identity of the elite in Renaissance Italy covering also decorative arts of Renaissance France and England. Then concentrates on European decorative arts from seventeenth and eighteenth centuries, with emphasis on Paris and London.

**ARTH 572 - Survey of Decorative Arts II**

Credits: 3 (NR)
This writing-intensive course is designed to equip students with the skills required for professional scholarship in the history of decorative arts. Students will examine a variety of theories and methods for analyzing objects through assigned readings, class discussions, and short writing assignments.

**ARTH 593 - Internship in Art History and the Decorative Arts**

Credits: 3-6 (NR)
Internship with a professional arts institution, organization, or individual in the Washington, D.C., area. Project to be arranged by student in consultation with faculty instructor and field supervisor.

Prerequisite(s): BA or equivalent or permission of instructor.

Notes: Recommended for advanced art history students seeking exposure to professional work in visual arts. May be taken for 3 to 6 credits, or repeated for up to 6 credits.
ARTh 594 - The Museum

Credits: 3 (NR)
Examines history, theory, practice, ethics, and current problems of collecting and displaying art and artifacts to the public. Emphasizes issues central to museums in Washington, D.C., or museums in other locations.

Prerequisite(s): Baccalaureate degree or permission of instructor.

Notes: Specific focus may vary with instructor.

ARTh 596 - Independent Study

Credits: 1-3 (RT)
Independent reading and research on specific project under direction of department member.

Prerequisite(s): Baccalaureate degree or permission of instructor.

Notes: Written report is required. May be repeated for credit.

ARTh 599 - Special Topics in Art History and the Decorative Arts

Credits: 1-6 (RT)
Topics vary.

Prerequisite(s): Baccalaureate degree or permission of instructor.

Notes: May be repeated for credit when topic is different.

ARTh 600 - Methods and Research in Art History
Investigates theories, methods, and research strategies in discipline of art history. Designed for first-semester students in art history MA program; foundation for further graduate-level work in the program.

**Prerequisite(s):** Admission to the art history MA program.

**ARTH 601 - Colloquium in Art History**

Credits: 3 (NR)
Colloquium offers graduate-level survey in academic art history, led by an instructor of record, with input from full Art History faculty. Participants review the current field through lectures, focused readings and group discussions with relevant faculty member. Participants may read in more depth in areas of special interest. Colloquium provides preparation for MA exams and professional preparation for teaching.

**Prerequisite(s):** Admission to the MA Program in Art History.

**ARTH 610 - Theory of Decorative Arts**

Credits: 3 (NR)
Covers the analysis of objects and design from a number of different perspectives: cultural studies, art history, Marxism, the Frankfurt School, and feminism among others. Offers for each approach different tools and viewpoints to analyze and understand decorative arts.

**ARTH 620 - Topics in Individual Decorative Arts**

Credits: 3 (RT)
Survey of a single decorative art including media and methods of production. Covers connoisseurship issues such as identifying materials and techniques, fakes, forgeries, repairs, reproductions.

**Notes:** May be repeated for credit when topic is different.

**ARTH 630 - Material Culture Studies**

Credits: 3 (RT)
Credits: 3 (RT)
Introduction to traditions that have contributed to the field of material culture study. Examines a broad range of the material world from the past to the present. Surveys the field’s historical roots and examines approaches to material culture scholarship.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 640 - European Decorative Arts**

Credits: 3 (RT)
Examines one or more European decorative arts from periods from the Renaissance to the early 20th century. Arts may include tapestries, pottery and ceramics, silver, furnishing, jewelry and metalwork, glass as well as distinctive stylistic periods.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 650 - Global Decorative Arts**

Credits: 3 (RT)
Examines specific key media, moments, or locations in the global decorative arts beyond the Western tradition.

Notes: May be repeated for credit with topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 660 - Museum Studies**

Credits: 3 (RT)
Explores the role of museums, through presentations by key museum personnel and discussion of required readings. Administrators, curators, conservators, educators, editors, among others, work with students to expand their knowledge of how museums function.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 670 - Design and Design History**
Credits: 3 (RT)
Examination of key moments in design history. Through focus on the chosen topic, discusses the nature of design. Covers history of interiors, furniture and architecture, and theories of design and design composition.

Notes: May be repeated for credit with topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 696 - Independent Directed Readings**

Credits: 3 (NR)
Designed to prepare students for comprehensive exams by integrating past work and filling gaps in expected knowledge before the exam.

Prerequisite(s): Admission to art history MA program, and permission of instructor.

Notes: Taken in final semester of art history MA.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

**ARTH 699 - Topics in Art History**

Credits: 3 (RT)
Research seminar on aspects of art history. Topics vary, but course entails extensive critical readings and discussion, development of bibliographies, and advanced-level research papers.

Prerequisite(s): Graduate standing.

Notes: May be repeated for a maximum of 15 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ARTH 797 - Thesis Writing Workshop**

Credits: 0 (NR)
Grading: Satisfactory/No Credit

**ARTH 799 - Master's Thesis**

Credits: 1-3 (RD)
Research and writing on approved thesis topic under direction of thesis committee.
Prerequisite(s): Completion of 24 credits (for art history) or 45 credits (for history of decorative arts) and approval of thesis proposal by the faculty and program director.

Notes: Students must register for a minimum of three credits in their first semester of 799 and maintain continuous enrollment in 799 while writing and submitting a thesis. A maximum of 3 credits of 799 may be applied to the MA in art history and a maximum of 6 credits to the MA in the history of decorative arts.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-6
Grading: Satisfactory/No Credit only

Art and Visual Technology (AVT)

Offered by the College of Visual and Performing Arts

AVT 101 - New Majors Colloquium

Credits: 1 (NR)
Provides a common core experience of contemporary perspectives on the broad range of professional career options open to studio art majors. Lectures address practical concerns but emphasize social, ethical, and philosophical aspects of visual arts professions.

Notes: Required of all AVT majors. May be taken prior to declaring the major or during the first semester as a declared AVT major.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

AVT 103 - Introduction to the Artist's Studio

Credits: 3 (NR)
Through projects, readings, class critiques, visuals, and field trips, students explore materials, techniques, concepts, and processes essential to understanding the language of visual arts and the artist's role. Develops imaginative thinking and sensitivity to visual environment.

Fulfills general education requirement in arts.

Notes: For non-majors only.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2

AVT 104 - Studio Fundamentals I
Credits: 4 (NR)  
Explores elements and principles of two-dimensional design, establishment of visual vocabulary, and critical analysis that supports conceptual development. Studio projects build fundamental knowledge, skills, understanding of precedents, and contemporary practices in visual arts.

Fulfills general education requirement in arts.

Hours of Lecture or Seminar per week: 2  
Hours of Lab or Studio per week: 4

**AVT 105 - Studio Fundamentals II**

Credits: 4 (NR)  
Explores elements and principles of three-dimensional design, establishment of visual vocabulary, and critical analysis that supports conceptual development. Studio projects explore form and composition, time-based media, materials, precedents, and contemporary practices in visual arts.

Prerequisite(s): AVT 104 or permission of instructor.

Hours of Lecture or Seminar per week: 2  
Hours of Lab or Studio per week: 4

**AVT 180 - New Media in the Creative Arts**

Credits: 3 (NR)  
Introduces computing from artist's perspective. Emphasizes computer use for artistic creation and research. Overview of image making and time-based media within the broad context of contemporary art, new media art, and mediated culture.

Fulfills general education requirement in information technology (all except ethics).

Hours of Lecture or Seminar per week: 1  
Hours of Lab or Studio per week: 2  
When Offered: Fall, Spring, Summer

**AVT 204 - Visual Thinking**

Credits: 3 (NR)  
Explores the ways contemporary artists use principles of design and perception to challenge how we see our world physiologically, psychologically, or socially. Examples drawn from film, photography, new media art, and other contemporary artistic media.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**AVT 206 - Color**
Credits: 4 (NR)
Color theory and principles of color interaction, including additive, subtractive, and partitive color experience; study of harmony, contrast, focus, space, opacity, transparency, temperature and value in both wet and dry media; and related applications of color technology.

Prerequisite(s): AVT 104 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 215 - Typography

Credits: 4 (NR)
Introduction to history and use of type. Reading and projects develop awareness of type as a linguistic and visual communication tool. Introduces typographic design elements, including color, hierarchy, integration with imagery, structure, and content.

Fulfills general education requirement in arts.

Prerequisite(s): AVT 104 and 180, or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 217 - Introduction to Web Design

Credits: 4 (NR)
An introduction to contemporary web design, in particular to standards, as a successful tool in design communication. Students gain hands-on experience on design issues specific to)Net-based presentations, learn web page layout, effective navigation and delve into the design process.

Prerequisite(s): AVT 180.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 1-12

AVT 222 - Drawing I

Credits: 4 (NR)
Introduction and exploration of the fundamentals of drawing methods and materials, with emphasis on observational study and critical analysis of the effective and expressive use of line, mass, value, perspective, and formal composition. Emphasis on problems involved in representational and abstract visual interpretations of forms.

Fulfills general education requirement in arts.

Notes: AVT majors encouraged to take AVT 222 with AVT 104.
AVT 232 - Painting I

Credits: 4 (NR)
Introduction to the basic methods and principles of painting with a focus on observation, paint application, formal composition, color mixing, and the articulation of form. Students develop a visual awareness as they become familiar with the language of image making, construction, analysis, and awareness. Students prepare portfolios for collaborative and reflective critique.

Fulfills general education requirement in arts.

AVT 243 - Printmaking I

Credits: 4 (NR)
Introduction to basics of hand printing. Emphasis on translation and transferal of images, tools, equipment, and technical skills for making a well-defined print. Students explore drawing, synthesis, and multiplicity in this interactive and collaborative course. Presentations and field trips focus on aesthetic and cultural concerns of making multiple images.

Fulfills general education requirement in arts.

AVT 252 - Fundamentals of Photography

Credits: 4 (NR)
Introduces basic principles and aesthetics of photography, 35-mm camera operation, and darkroom practices, including film processing and print development.

Fulfills general education requirement in arts.

AVT 253 - Introduction to Digital Photography

Credits: 4 (NR)
Introduction to the digital camera as a tool for electronic photographic image making. Students will be introduced to principles and exploration of the aesthetics of digital photography and also learn basic image-editing skills in a computer environment.
Fulfills general education requirement in arts.

**AVT 254 - Photography**

Credits: 4 (NR)
Introduces photographic study and investigation of the fundamental practices and techniques of both film and digital forms with attention to its history and contemporary practices. Class discussions, field trips and critiques enhance visual and verbal vocabularies.

Prerequisite(s): Restricted to AVT majors and AVT minors.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4

**AVT 262 - Sculpture I**

Credits: 4 (NR)
Projects in sculpture that emphasizes contemporary theory and issues, the development of individual concepts, and creative solutions. Explores the application of materials, tools, and imaginative processes. Faculty demonstrations, lectures, gallery and museum visits, and regular student work critiques.

Fulfills general education requirement in arts.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4

**AVT 272 - Interdisciplinary Arts**

Credits: 4 (NR)
Introduces contemporary interdisciplinary art practice through readings and studio projects in performance and installation. Provides students with opportunities to deepen understanding of conceptual art, nontraditional media practices, and collaborative practice in visual arts.

Fulfills general education requirement in arts.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 2

**AVT 280 - Introduction to New Media Arts**
Credits: 4 (NR)
Investigates ways in which contemporary artists employ tools in response to social, political and cultural conditions. Students create meaningful works of art that demonstrate conceptual and contextual awareness plus technical ability.

Prerequisite(s): AVT 104 and AVT 180, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring, Summer

AVT 300 - Artsbus Attendance

Credits: 0 (RT)
Students travel to New York or other destinations aboard the AVT Artsbus to attend faculty-selected exhibitions.

Notes: AVT majors must satisfactorily complete course once for each semester they are enrolled as majors, up to five times. Repeatable up to three times per semester.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: S/NC

AVT 301 - Visual Voices Colloquium

Credits: 1 (RD)
Students attend AVT Visual Voices lecture series during the semester and complete assignments related to the topics covered.

Notes: AVT majors must accumulate at least 3 credits in this colloquium to graduate. May be repeated each semester up to a total of 8 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

AVT 305 - Creative Processes

Credits: 3 (NR)
Study of the creative process in general, with emphasis on the inspiration, working methods, and final creations of various artists. Students explore their own creative processes through journal keeping, collaborative exercises, and projects.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 307 - Aesthetics
Interdisciplinary course examines broad range of contemporary art and culture to engage an expansive conception of aesthetic experience. Students engage with historical and contemporary aesthetic theories, build heightened aesthetic sensibility, and explore their personal aesthetic.

**AVT 309 - Art as Social Action**

Credits: 3 (NR)
Interdisciplinary exploration of work by citizen-artists whose art-making engages the social world. Students learn about the history of socially engaged art-making and experiment with individual and collaborative projects addressing social issues.

**AVT 311 - Graphic Design Methods and Principles**

Credits: 4 (NR)
Emphasis on developing design solutions requiring demographic, historical, and/or cultural research. Course strengthens design and typography skills, introduces conceptual problem solving, audience considerations, and broad-based tools designers use to develop effective visual communication solutions.

Prerequisite(s): AVT 215 or permission of instructor. Prerequisite enforced by registration system.

**AVT 313 - Editorial Design**

Credits: 4 (NR)
Development and production of long-form design projects (magazines, newspapers, catalogs, and other serial and/or multipage publications). Emphasis on narrative, consistency, structure, clarity. Addresses information design issues, and reinforces conceptual skills and integration of imagery and text.

Prerequisite(s): AVT 311 or permission of instructor. Prerequisite enforced by registration system.

**AVT 323 - Drawing II**
Credits: 4 (NR)
Students develop observational, sketching, and rendering skills. Introduction to a range of materials, methods, formal concepts, drawing in series, and critique vocabulary.

Prerequisite(s): AVT 222 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 324 - Figure Drawing

Credits: 4 (NR)
Drawing with an emphasis on the observational study of the human body. Human anatomy and proportion are examined through a series of methodological approaches, including gesture, contour, mass, and modeling.

Prerequisite(s): AVT 222 or permission of the instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 326 - Nontraditional Approaches to Drawing

Credits: 4 (NR)
Encourages students to challenge some traditional approaches to drawing by creating innovative works that combine familiar drawing techniques with a variety of materials, approaches, and unusual formats.

Prerequisite(s): AVT 222 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 328 - Mixed Media

Credits: 4 (NR)
Students investigate the contemporary innovations and disciplinary cross-pollination which have revolutionized and expanded the boundaries of traditional fine arts. Projects incorporate text, sound, computer generated imagery, collaboration and installation.

Prerequisite(s): AVT 104.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring

AVT 333 - Painting II
Focuses on the development of formal and technical skills, with an emphasis on paint application, color interaction, and support building and preparation. Introduces concepts, methodologies, and approaches relevant to contemporary painting.

Prerequisite(s): AVT 232 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 336 - Experimental Painting

Credits: 4 (NR)
Using contemporary painting practices as starting place, students explore a variety of experimental and conceptual approaches to painting.

Prerequisite(s): AVT 232 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 337 - Figurative Painting

Credits: 4 (NR)
Working primarily with live models, students explore the human form as the main subject for a variety of visual and expressive inquiries.

Prerequisite(s): AVT 232 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 343 - Printmaking II

Credits: 4 (NR)
An introduction to relief, screenprint, and intaglio printing, including the study of historical antecedents and their relevancy to contemporary printmaking. Students learn reductive and additive techniques in preparing printing surfaces.

Prerequisite(s): AVT 243 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 345 - Paper/Print/Book as Language
Introduces the artist's book as both physical structure and creative association of words and images. Students learn techniques of bookmaking, binding, and traditional and digital printmaking to produce an artist-made book with narrative and sequential elements.

Prerequisite(s): AVT 180 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

**AVT 346 - Digital Printmaking**

Credits: 4 (NR)
A beginning course in hand printing digitally processed images. Projects focus on electronic means of creating and manipulating imagery. Students achieve skills in multiple steps and incremental development required in making prints.

Prerequisite(s): AVT 180 or permission of the instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

**AVT 353 - Traditional Photo Methods**

Credits: 4 (NR)
Continuation of Fundamentals of Photography with further investigation into the aesthetics of photography through experimentation with new camera formats, films, papers, developers and development of a photographic portfolio.

Prerequisite(s): AVT 252 or permission of instructor.

Notes: Continuation of Photography I.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

**AVT 354 - Digital Photo Techniques**

Credits: 4 (NR)
A computer-intensive class in which students create digital images from the viewpoint of a photographic artist. Emphasis on digital photo techniques, including making digital negatives, concept development, and visual aesthetics.

Prerequisite(s): AVT 253 and 180, or permission of the instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
AVT 355 - Color Photo Methods

Credits: 4 (NR)
Introduces basic concepts, theories, histories, contemporary materials, and processes of color photography with focus on creative photographic expression and technique. Combines lecture, studio, and darkroom time to expand students' photographic repertoire through work with both film and digital materials.

Prerequisite(s): AVT 353 or 356 or permission of the instructor.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 1-12
When Offered: Fall

AVT 356 - Fundamentals of Studio Lighting

Credits: 4 (NR)
Introduces theory, concepts, and applications of photographic studio lighting using both artificial and natural light sources with an emphasis on the ability to control and manipulate light.

Prerequisite(s): AVT 353 or AVT 354 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 359 - About Photography: Practice and Research

Credits: 3 (NR)
A combined studio and lecture course investigating photography's history, critical theory, philosophy, and practice. Lectures, discussions, readings, and projects focus on a medium that has enormously influenced art and culture.

Equivalent to AVT 459 (2010-2011 Catalog)

Prerequisite(s): AVT 252 or AVT 253.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 363 - Sculpture II

Credits: 4 (NR)
Expands on the principles and processes introduced in Sculpture I, developing a higher level of technical competence and critical sophistication.

Prerequisite(s): AVT 262 or permission of instructor.

Notes: Lectures, independent student research, and gallery and museum visits required. Vigorous critiques.
AVT 370 - Entrepreneurship in the Arts

Credits: 4 (NR)
Combined lecture and studio course in developing entrepreneurial skills in arts. Special focus on developing communication skills and planning strategies, as well as on nurturing skills that enable students to creatively solve problems and think about opportunities.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 371 - Visual Perception and the Arts

Credits: 3 (NR)
Review of major approaches to the study of visual perception. Topics include analysis of picture perception, visual thinking, the relationship between symbolic and non-symbolic thinking and representation, and how pathologies of vision affect art production.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 372 - Hip Hop Culture

Credits: 3 (NR)
Examines hip hop as an art form within a continuum of cultural expression. Explores multilayered social, political, and aesthetic aspects of hip hop, historical causes and precedents, and contemporary derivatives and implications.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 373 - Performance Studio

Credits: 4 (NR)
Studio course focused on theory and practice of collaborative performance art. Detailed analysis of creation and production processes from interdisciplinary perspective in conjunction with practical training in multimedia technologies, body sculpture, and theater of images.

Prerequisite(s): AVT 272 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
AVT 374 - Sound Art I

Credits: 4 (NR)
Introduction to the physics, phenomenology, and production of sound as an expressive medium. Using analog and digital tools, students will explore constructing with sound.

Prerequisite(s): AVT 180 or 280, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2
When Offered: Fall, Spring.

AVT 376 - Live Movies

Credits: 4 (NR)
Advanced performance studio emphasizing cinematic forms and multimedia technologies. Also covers sound design, scenic design and materials, production planning, and interdisciplinary approaches to narrative and content in performance.

Prerequisite(s): AVT 272 or permission of instructor.

Notes: Students collaborate on production projects.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 377 - Cyberpunk

Credits: 4 (NR)
Traces the ways that cinema, music, fiction, cultural theory, visual art, television, theater, and performance have embraced and been shaped by cyberpunk and cyberculture. Includes readings, writings, discussion, screenings, guest speakers, and research projects.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

AVT 378 - The African American Experience in the Performing Arts

Credits: 3 (NR)
Through lectures, slides, audio recordings, videos, and films, students examine African American contributions to cultural fabric of American forms and institutions. Artistic contributions examined in aesthetic, political, historical, and social contexts.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
AVT 382 - 2D Experimental Animation

Credits: 4 (NR)
Introduces conceptual, contextual, technical, and aesthetic practices of two-dimensional experimental animation. Students learn to animate hand-drawn and computer-generated images. Students work to create an imaginative and meaningful short animation with sound.

Prerequisite(s): AVT 280 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring

AVT 383 - 3D Experimental Animation

Credits: 4 (NR)
Students create socially relevant 3D scenes with scaled objects, surface textures, lights, and shadows. These scenes serve as environments for short, thought-provoking animations. Emphasis on idea development, critical examination of animation practices, and visual aesthetics.

Prerequisite(s): AVT 280 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring

AVT 385 - EcoArt

Credits: 4 (RD)
Develop collaborative projects that explore art and visual culture, the environment and sustainability. Students are given access to the School of Art Permaculture Studio as a "green" work space for developing course projects. Designated a Green Leaf Course.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring

AVT 390 - Video Art

Credits: 4 (NR)
Integrates study of contemporary art theory, montage theory, and artistic practices with application to new media and technology. Special focus on visual culture and video art, sound design, and the sociopolitical implications of media.
Prerequisite(s): AVT 280 or permission of the instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring

AVT 392 - Gallery Practices

Credits: 4 (NR)
Introduction to practices of the contemporary art gallery, including curatorship, exhibition planning and installation, care and proper handling of artwork, technology in the gallery, collaborating with outside curators, documentation, budget, publicity, and educational and docent activities.

Prerequisite(s): 3 credits of AVT or ARTH, junior standing, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 393 - Field Experience in the Arts

Credits: 1-6 (RD)
Introductory working and learning experience with an organization or individual in the arts, or as a teaching assistant.

Prerequisite(s): Junior standing and permission of instructor and academic advisor.

Notes: Placement documentation to include 45 hours of work per credit. May be repeated for credit for maximum 6 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

AVT 394 - Honors Seminar

Credits: 1 (RD)
Offers highly motivated students opportunities to interact with art world professionals through field trips, research, critiques, and creative assignments.

Prerequisite(s): By invitation to qualified honors students.

Notes: Students accrue credits toward graduation with AVT honors. Repeatable for up to 8 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

AVT 395 - Writing for Artists
Credits: 3 (NR)
Practical writing seminar in which students practice typical writing needs of creative professionals, including artist's statements, grant proposals, and reviews, while also exploring ways in which artists have used writing, books, and language in art making.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ENGL 302/ENGH 302 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 407 - Advanced Aesthetics

Credits: 3 (NR)
Advanced examination of aesthetic concepts and theories, focusing on issues pertinent to artmaking.

Prerequisite(s): AVT 307 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
 When Offered: Fall, Spring.

AVT 411 - Motion Design

Credits: 4 (NR)
Motion Design introduces the theories, techniques and practices of motion design and the integration of design, image, sound, video and animation.

Prerequisite(s): Admission to AVT BFA Graphic Design concentration, AVT 217 and 311 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring

AVT 412 - Advanced Typography

Credits: 4 (NR)
An advanced exploration of type, design and the graphic organization of visual information. Emphasis is on the aesthetic and technical execution of typographic hierarchy in visual communications.

Prerequisite(s): Admitted AVT BFA Graphic Design concentration, AVT 313 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring.
AVT 413 - Professional Design Practices

Credits: 4 (NR)
Professional Design Practices is a course that addresses the nature of the professional graphic designer in terms of career development and self-marketing, visual presentations of design work, preparation of written materials and interview techniques. Special emphasis will be given to the development of a design business, as well as freelance and pro-bono design work.

Prerequisite(s): Admitted AVT BFA Graphic Design concentration, AVT 313 and 414 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring.

AVT 414 - Corporate Design and Branding

Credits: 4 (NR)
Fundamentals of branding and identity design. Topics include logo development, product packaging, marketing and advertising collaterals, web branding, and broadcast advertising development. Special attention is given to the creation of a graphics standards guide.

Prerequisite(s): AVT 252 or 253, AVT 311, and AVT 395 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 415 - Web Design and Usability

Credits: 4 (NR)
Introduces students to web design, usability, and the use of popular applications for static, interactive, and motion-based web development.

Prerequisite(s): Admitted to AVT BFA Graphic Design concentration, AVT 217 and 311, AVT 313 or 414 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring.

AVT 416 - Advertising Design

Credits: 4 (NR)
Advertising Design provides insight and practice in the creative design process behind effective and memorable advertising.
Emphasis will on the design and presentation of a series of portfolio-ready advertising campaigns for actual client use.

**Prerequisite(s):** Admitted AVT BFA Graphic Design concentration, AVT 414 or permission of instructor. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4  
**When Offered:** Fall, Spring

**AVT 417 - Package Design**

Credits: 4 (NR)  
Provides a focused studio experience to conceptualize and design multiple applications for contemporary package design.

**Prerequisite(s):** Admitted AVT BFA Graphic Design concentration, AVT 414 or permission of instructor. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4  
**When Offered:** Fall, Spring.

**AVT 418 - History of Graphic Design**

Credits: 3 (NR)  
Survey of design history. Looks at print and web design as both a reaction to and shaper of the broader culture (including other fine and applied arts) through the study of major movements and designers.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**AVT 419 - Topics in Graphic Design**

Credits: 1-6 (RT)  
Rotating subjects give students a deep look into and appreciation of a specific topic in design practice.

**Prerequisite(s):** AVT 311 and either AVT 313 or 414. Prerequisite enforced by registration system.

**Notes:** Topics and credit vary with instructor. May be repeated when taken under different topics.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0-6

**AVT 420 - Advanced Web Design**
Building on the principles and skills gained in AVT 415, this course delves deeper into web-related concepts and techniques. Students will gain advanced knowledge in evolving web technology, preparing them for professional entry into the web design field.

**Prerequisite(s):** Admission to AVT BFA Graphic Design concentration, AVT 415 or permission of instructor. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

### AVT 422 - Drawing III

Credits: 4 (NR)  
Builds on intermediate drawing skills, emphasizing individual exploration and expressive techniques. Along with rigorous observational study, students work from a variety of sources to develop a broad understanding of visual solutions within contemporary art practice.

**Prerequisite(s):** AVT 323 or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4

### AVT 423 - Drawing IV

Credits: 4 (NR)  
Students learn and practice advanced drawing skills and techniques in a variety of media and formats. Emphasis on development of content, personal sources, techniques, presentation strategies, and methods of analysis through critique.

**Prerequisite(s):** AVT 422 or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4

### AVT 432 - Painting III

Credits: 4 (NR)  
Intermediate course with an emphasis on developing personal content, concepts, painting strategies, and a practical understanding of contemporary ideas in painting.

**Prerequisite(s):** AVT 333 or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4
AVT 433 - Painting IV

Credits: 4 (NR)
In this capstone course, students engage in a self-directed studio practice through the development of content, personal sources, techniques, presentation strategies, and methods of analysis through critique.

**Prerequisite(s):** AVT 432 or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4

AVT 434 - Painting V

Credits: 4 (NR)
Students work rigorously and independently, advancing individual studio practice through in-depth dialogue with faculty and formal group critiques. Emphasis on individual decision making, personal initiative, and critical vocabularies.

**Prerequisite(s):** AVT 433 or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4

AVT 435 - Painting VI

Credits: 4 (NR)
Advanced directed research in painting. Employing rigorous concepts, presentation strategies, and in-depth critique, students develop independent projects into a cohesive body of work.

**Prerequisite(s):** AVT 434 or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4

AVT 442 - Printmaking III

Credits: 4 (NR)
An intermediate print media course with an emphasis on a wider variety of tools and concepts that investigate photo-based imagery and advance personal narrative.

**Prerequisite(s):** AVT 343 or permission of the instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4
AVT 443 - Printmaking IV

Credits: 4 (NR)
An advanced print media course that uses hand-drawn, digital, and photo-based imagery. Students explore traditional and new printmaking techniques in a series of related prints and explore their relevancy to contemporary printmaking.

Prerequisite(s): AVT 442 or permission of the instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 444 - Printmaking V

Credits: 4 (NR)
Advanced print media course incorporating three-dimensional applications of hand printmaking. Students develop concepts in digital printmaking, book making, sculptural prints, and installation works. Explores issues in contemporary printmaking through critical discussions, reading, and writing assignments.

Prerequisite(s): AVT 443 or permission of the instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 445 - Printmaking VI

Credits: 4 (NR)
Students produce a body of print media work reflecting their interests, including the broader context of social, cultural, and contemporary issues. Students engage in collaborative studio practices and independent projects to integrate multiple visual technologies.

Prerequisite(s): AVT 444 or permission of the instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 452 - Advanced Traditional Photo Methods

Credits: 4 (NR)
Intensive, advanced darkroom course with emphasis on fine art and craft of black-and-white photographic print. Students produce a personal portfolio based on technical instruction, contemporary photographic approaches and thought, and critical readings and discussions.

Prerequisite(s): AVT 353 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
AVT 453 - Professional Photo Practices

Credits: 3 (NR)
The course further investigates portfolio development and introduces photography students to a range of professional career options. Emphasis is on portfolio development, internships and developing promotional materials such as websites and resumes. Includes studio, gallery and/or museum visits and guest speaker(s).

Prerequisite(s): AVT 353 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 454 - Alternative Photo Processes

Credits: 4 (NR)
Introduction to 19th century and nontraditional photographic processes including cyanotype, van dyke, gum bichromate, liquid emulsion, and image transfer. Exploration and discussion of photography’s influences, application, and use in other mediums.

Prerequisite(s): AVT 353 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 455 - Digital Printing Techniques

Credits: 4 (NR)
Continuation of 354 Digital Photo Methods with further examination into digital techniques, personal expression and digital printing. Course emphasis is on the fine art and craft of the digital print and portfolio development.

Prerequisite(s): AVT 354 or permission of instructor.

Notes: Continuation of AVT 354

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 456 - Large Format Photography

Credits: 4 (NR)
An introduction to basic concepts, controls, and exposure theories of large format photography. Students develop an aesthetic knowledge of the view camera's potential working with 4” x 5” view cameras in the studio and field.

Prerequisite(s): AVT 353 or permission of instructor.
AVT 457 - Documentary Photography

Credits: 4 (NR)
Introduces documentary photography: techniques, history, choices, and ideas necessary to create meaningful photo essays that incorporate a personal, committed, in-depth approach to seeing and depicting lives and situations.

Prerequisite(s): AVT 452 or permission of instructor.

AVT 458 - Advanced Studio Lighting

Credits: 4 (NR)
The advanced study of photographic studio lighting concepts using electronic strobes and power packs with emphasis placed on constructing studio materials, metering techniques, staging complex sets, and on-location photography.

Prerequisite(s): AVT 356 or permission of instructor.

AVT 462 - Sculpture III

Credits: 4 (NR)
Advanced studio course for continued individual, conceptual, and critical development in sculpture. Biweekly seminar, independent research, museum and gallery visits, vigorous individual and group critiques, required documentation, and portfolio preparation supporting studio projects.

Prerequisite(s): AVT 363 or permission of instructor.

AVT 463 - Sculpture IV

Credits: 4 (NR)
Intensive studio course for advanced sculpture students to further individual, conceptual, and critical development. Students produce a body of work based on technical exploration, critical discussion, reading, and writing.

Prerequisite(s): AVT 462 or permission of instructor.
AVT 464 - Sculpture V

Credits: 4 (NR)
Advanced studio course for rigorous and independent production of sculpture. Weekly topical seminar, vigorous critiques, museum and gallery visits, professional documentation, and research resulting in a body of work to be exhibited.

Prerequisite(s): AVT 463 or permission of instructor.

AVT 465 - Sculpture VI

Credits: 4 (NR)
Students work rigorously and independently, gaining insights into personal process and direction through one-on-one critical dialogue with faculty and formal group critiques. Emphasizes individual decision making and personal initiative.

Prerequisite(s): AVT 464 or permission of instructor.

Notes: Continuation of advanced work in AVT 465.

AVT 472 - Critical Theory in the Visual Arts

Credits: 3 (NR)
Examination of currents in theory and criticism that inform contemporary practice and critical analysis in the visual arts.

Prerequisite(s): ARTH 374 or permission of instructor.

AVT 473 - Advanced Performance Studio

Credits: 4 (NR)
Prerequisite(s): AVT 373 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 474 - Sound Art II

Credits: 4 (NR)
Extends a working knowledge of the materiality of sound into an in-depth exploration of creation in the sonic realm. May include synthesis, circuit-bending, use of field recordings and other samples, and live performance.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring.

AVT 482 - Advanced Image Making

Credits: 4 (NR)
In-depth look at the processes and mechanisms used to generate, reconstruct, and/or create new media images. Students are required to create a series of contextually related images and to further develop their critical analysis abilities.

Prerequisite(s): AVT 280 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 483 - Art and Interactivity

Credits: 4 (NR)
Provides a context for art making as an interactive and participatory experience while critically examining the ways in which technologies may aid and also inhibit engagement with the social and political world.

Prerequisite(s): AVT 280 plus one 300-level New Media Arts course, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 487 - Advanced Topics: New Media Art

Credits: 4 (NR)
Provides a context for exploring current developments in new media art practice in and outside the studio. Specific course content adapts and responds to ongoing movements in new media art and contemporary culture.

Prerequisite(s): AVT 280 plus one 300-level New Art Course, or permission of instructor.
AVT 489 - Internship in Art and Visual Technology

Credits: 1-6 (RD)
Unpaid professional-level work experience in a professional organization or with an individual artist, related to the student's concentration and career plans.

Prerequisite(s): Senior standing, completion of 12 concentration credits, and permission of instructor.

Notes: Placement documentation to include 45 hours of work per credit. May be repeated for credit for maximum 12 credits.

AVT 491 - Independent Study in Art and Visual Technology

Credits: 1-6 (RT)
Opportunity for development of advanced skills and concepts in a field of interest. Study proposal must be approved by instructor prior to registration.

Prerequisite(s): Senior standing, completion of 12 concentration credits, and permission of instructor.

Notes: Project documentation to include 45 hours of work per credit. May be repeated for credit for maximum 24 credits.

AVT 493 - Teaching Visual Thinking Through Media, PK-12

Credits: 3 (NR)
Investigates range and appropriateness of media and materials that encourage creative expression in the art classroom for PK-12 students, and expands the artist-teacher's visual repertoire. Incorporates art history, criticism, and aesthetics, as well as language arts and other content areas that challenge students' artistic growth and human development.

Prerequisite(s): AVT 495 or permission of art education director.

AVT 494 - Teaching Critical Response to Art, PK-12
Credits: 3 (NR)
Develops visual literacy and critical-thinking skills for application to the PK-12 classroom by examining diverse theoretical models and applying strategies to expand knowledge about art and artifacts. Includes intensive writing, readings, discussions, museum work, research and Internet skills, and studio work.

Prerequisite(s): AVT 495 or permission of art education director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 495 - Introduction to Art Teaching and Learning

Credits: 3 (NR)
Explores art-teaching profession through readings, discussion, hand-son activities, and visits to diverse area public schools. Students discover a variety of ways that art is taught and evaluated to meet multiple educational needs of today's PK-12 students.

Prerequisite(s): Junior standing, completion of ENGL 302/ENGH 302, and completion of at least 20 credits of AVT coursework (including AVT 307); or permission of art education director.

Notes: Prior to enrollment, students must complete art education inquiry form.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 496 - Special Topics: (specific course title varies)

Credits: 1-4 (RD)
Explores topical studies in AVT including theoretical and critical aspects of art or studio production.

Notes: Topics and credit vary with instructor. May be repeated when taken under different topics.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0-4

AVT 497 - Senior Project

Credits: 4 (NR)
Capstone course in which students develop and present a cohesive body of work along with written materials and documentation. Students participate in critiques with visiting artists or AVT faculty and in workshops supporting professional goals.

Fulfills general education requirement in synthesis.

Prerequisite(s): Senior art and visual technology major, completion of 12 concentration credits, and completion of or concurrent enrollment in all required general education courses.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
AVT 498 - Senior Design Project

Credits: 4 (NR)
Capstone course in which students develop and present a design project exploring the possibilities of personal or professional expression. Students participate in critiques with visiting artists or AVT faculty and in workshops supporting professional goals.

Fulfills general education requirement in synthesis.

Prerequisite(s): Senior art and visual technology major, completion of AVT 311, 313, and 414, and completion of or concurrent enrollment in all required general education courses. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 507 - Advanced Aesthetics

Credits: 3 (NR)
Graduate seminar in aesthetic concepts and theories, focusing on issues pertinent to artmaking.

Prerequisite(s): Admission to the MFA program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

AVT 522 - Drawing V

Credits: 4 (NR)
Drawing on an advanced level, emphasizing individual decision-making and personal initiative.

Prerequisite(s): Admission to the AVT graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 523 - Drawing VI

Credits: 4 (NR)
Drawing on an advanced level, emphasizing individual decision-making and personal initiative.

Prerequisite(s): Admission to the AVT graduate program, AVT 522, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4
**AVT 595 - Introduction to Art Teaching and Learning**

Credits: 3 (NR)
Explores art-teaching profession through readings, discussion, hands-on activities, visits to diverse area public schools and action research. Students analyze ways that art is taught and evaluated to meet multiple educational needs of today's PK-12 students.

Prerequisite(s): Admission to MAT Program or permission by the art education advisor or director

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**AVT 596 - Independent Study**

Credits: 1-6 (RT)
Independent reading and research on specific project under department faculty member's direction.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: Written reports required. May be repeated for credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**AVT 599 - Special Topics in Art and Visual Technology**

Credits: 1-6 (RT)
Exploration of topical studies in AVT, including theoretical and critical aspects of art or studio production.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: Topics and credit vary with instructor. May be repeated when taken under different topics.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0-6

**AVT 600 - Research Methodologies**

Credits: 3 (NR)
Graduate seminar focusing on development of independent research project in student's area of emphasis. Explores principal methods of researching and documenting art and arts practice. Along with traditional methods of library research, emphasizes new processes of examination and investigation through the use of computer-aided research systems.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.
AVT 605 - Issues and Research in Art Education

Credits: 3 (NR)
Readings and projects explore historical and contemporary ideas, issues, philosophies, pedagogy, and research in art education. Investigates teachers' use of research-oriented questions and data to explore classroom issues and improve teaching and learning.

Prerequisite(s): Admission to the MAT program and permission of instructor.

AVT 606 - Creativity and Cognition in the Arts and Media

Credits: 3 (NR)
Focuses on research on cognition, development, learning, and creativity in the visual arts and media in formal and informal educational settings.

Equivalent to EDEP 601

AVT 610 - Graduate Seminar

Credits: 2 (RD)
Students present their work or the work of contemporary artists for discussion and peer and faculty critiques. Special focus on developing public communication and presentation skills on contemporary issues in the arts.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: Seminar course required of all AVT graduate students four times during course of study. Repeatable for 8 credits.

AVT 611 - Graduate Design Seminar

Credits: 1 (RD)
A laboratory for the exploration of contemporary design theory and practice through writing and design making, this class will have rotating topical content.
AVT 612 - Independent Project Research

Credits: 1 (RD)
Provides the development and research phase in preparation for AVT 794: Independent Design Project, the capstone course in the Graphic Design masters program. Students will prepare their written final project proposal for presentation to the AVT GD Graduate Faculty Committee.

Prerequisite(s): Admission to AVT MA Graphic Design program and completion of 30 graduate credits.

Notes: To be completed prior to enrolling in AVT 794: Independent Design Project.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall, Spring.

AVT 613 - Graphic Design History

Credits: 3 (NR)
A survey of design history, examining print and web design as both a reaction to and shaper of the broader culture (including other fine and applied arts) through the study of major movements and designers.

Prerequisite(s): Admission to AVT graduate program or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 614 - Brand Identity Design

Credits: 4 (NR)
This is an advanced design course with an emphasis on brand identity development. Topics include logo development, product packaging, marketing and advertising collaterals, web branding, and broadcast advertising development. Special attention is given to the creation of a graphic standards guide.

Prerequisite(s): Admission to the AVT graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 615 - Technology for Art Teachers
Addresses use of technology in PK-12 art classroom. Focuses on research, presentation and instruction, and image creation. Students develop technology-enhanced teaching units for different grade levels and explore related issues, including copyright, plagiarism, and appropriation.

Prerequisite(s): Admission to the Art Education concentration ASTL and/or permission of art education director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

AVT 616 - Advanced Art and Interactivity

Credits: 5 (NR)
Studio, lecture course investigating art as networked activity. Particular attention focused on Internet as context for creation, distribution, and patronage of art.

Prerequisite(s): Admission to AVT graduate program.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6

AVT 617 - Advanced Typography

Credits: 4 (NR)
Students will produce a body of work exploring the opportunities and limitations of typographical design.

Prerequisite(s): Admission to graphic design MA (or MFA) program, or permission of the instructor.

Corequisite(s): Admission to the AVT graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 618 - Visual Communication Theories

Credits: 2 (NR)
Advanced graduate seminar focusing on key theories and themes that have informed 20th and 21st century design practice. Explores theory and criticism in a variety of contexts, from popular to scholarly, and considers the role of designers as thinkers and writers.

Prerequisite(s): Admission to MFA program, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.
**AVT 619 - Advanced Web Design**

Credits: 4 (NR)
Develops skills for the application of information, interaction, usability, and visual design for web site developments. Students gain in-depth knowledge of user behaviors and broader context of social, cultural, and contemporary issues in web communication. Students learn professional design processes and integrate multiple web developing technologies.

**Prerequisite(s):** Admission to Graphic Design MA program or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4

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**AVT 620 - Theory, Criticism, and the Visual Arts**

Credits: 3 (NR)
Cross-disciplinary graduate seminar focusing on key theories and themes that have informed 20th- and 21st-century arts practice. Explores theory and criticism in a variety of contexts, from popular to scholarly, and considers the role of artists as thinkers and writers.

**Prerequisite(s):** Admission to AVT graduate program or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**AVT 621 - Art Writing Seminar**

Credits: 3 (NR)
Seminar in Art writing, including criticism, the artist statement, manifestos and language as visual art.

**Prerequisite(s):** Admission to the MFA program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

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**AVT 622 - Advanced Drawing**

Credits: 4 (NR)
Advanced directed research in drawing with continued development of individual aesthetic. Study of historical and philosophical precedents integral.

**Prerequisite(s):** Admission to AVT graduate program or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 4
AVT 632 - Graduate Painting I

Credits: 4 (NR)
Entering students are expected to be competent painters, with technical proficiency, a disciplined process, and a directed personal vision. Students work rigorously and independently toward the understanding and mastery of techniques, methods, and concepts relevant to formal expression of personal content. Students expected to participate in critical discourse with supervising faculty. Achievement measured by faculty review board at mid-semester and term's end.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 633 - Graduate Painting II

Credits: 4 (NR)
Building on research and practices established in Graduate Painting I, students continue to develop strategies for the expression of personal vision and style. Progress tracked and assessed through periodic one-on-one critical discussions with supervising faculty. Achievement measured by faculty review board at mid-semester and term's end.

Prerequisite(s): AVT 632, or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 634 - Advanced Graduate Painting I

Credits: 4 (NR)
Working independently on a cohesive body of work, students must demonstrate a thorough understanding and mastery of techniques, methods, and concepts relevant to their own practices, and be able to discuss their work within the context of historical and contemporary art practices. Progress tracked and assessed through periodic one-on-one critical discussions with supervising faculty. Achievement measured by faculty review board at mid-semester and term's end.

Prerequisite(s): AVT 633, or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 635 - Advanced Graduate Painting II

Credits: 4 (NR)
AVT 635, Advanced Graduate Painting II, Advanced independent studio production. Progress tracked and assessed through periodic critical discussions with supervising faculty. Achievement measured by faculty review board at mid-semester and end of term.

Prerequisite(s): AVT 634, or permission of instructor.
AVT 641 - Graduate Graphic Design I

Credits: 4 (NR)
Working independently on a cohesive body of work, students must demonstrate a thorough understanding and mastery of techniques, methods, and concepts relevant to their own practices, and be able to discuss their work within the context of historical and contemporary design practices. Progress tracked and assessed through periodic one-on-one critical discussions with supervising faculty. Achievement measured by faculty review board at term’s end.

Prerequisite(s): Admission to MFA program.

AVT 642 - Graduate Printmaking I

Credits: 4 (NR)
Directed research and practice in printmaking focuses on individualized development of content and technique. Explores intellectual and expressive aspects of printmaking process.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

AVT 643 - Graduate Printmaking II

Credits: 4 (NR)
Directed research and practice in printmaking focuses on individualized development of content and technique. Explores intellectual and expressive aspects of printmaking process.

Prerequisite(s): AVT 642 or permission of instructor.

AVT 644 - Advanced Graduate Printmaking I
Credits: 4 (NR)
Intensive course of creative exploration in print media that furthers students' independence through production of individualized body of work reflecting interests within the broader contexts of contemporary social, technological, and cultural issues. Students also engage in collaborative studio practices to integrate visual technologies in their work. These may include digital imaging, drawing, graphic design, painting, performance, photography, and sculpture.

**Prerequisite(s):** Admission to the AVT graduate program, AVT 643, or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 6

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**AVT 645 - Advanced Graduate Printmaking II**

Credits: 4 (NR)
Intensive studio course that furthers student independence through production of a body of work reflecting a broad context of social, cultural and contemporary issues.

**Prerequisite(s):** Admission to MFA program, and AVT 644.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 4  
**When Offered:** Fall, Spring.

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**AVT 646 - Graduate Graphic Design II**

Credits: 4 (NR)
Continuing to work independently on a cohesive body of work, students must demonstrate a thorough understanding and mastery of techniques, methods, and concepts relevant to their own practices, and be able to discuss their work within the context of historical and contemporary art and design practices. Progress tracked and assessed through periodic one-on-one critical discussions with supervising faculty. Achievement measured by faculty review board at term’s end. (This is the second course in a two-course sequence.)

**Prerequisite(s):** Admission to MFA program.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 4  
**When Offered:** Fall, Spring.

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**AVT 647 - Advanced Graduate Graphic Design I**

Credits: 4 (NR)
Working independently on a cohesive body of work, students must demonstrate a thorough understanding and mastery of techniques, methods, and concepts relevant to their own practices, and be able to discuss their work within the context of historical and contemporary design practices. Progress tracked and assessed through periodic one-on-one critical discussions with supervising faculty. Achievement measured by faculty review board at term’s end.

**Prerequisite(s):** Admission to MFA program, and AVT 646
AVT 648 - Advanced Graphic Design II

Credits: 4 (NR)
Continuing to work independently on a cohesive body of work, students must demonstrate a thorough understanding and mastery of techniques, methods, and concepts relevant to their own practices, and be able to discuss their work within the context of historical and contemporary art and design practices. Progress tracked and assessed through periodic one-on-one critical discussions with supervising faculty. Achievement measured by faculty review board at term’s end. (This is the second course in a two course sequence.)

Prerequisite(s): Admission to MFA program, and AVT 647.

AVT 652 - Graduate Photography I

Credits: 4 (NR)
Critical theory and directed practice in photography focusing on development of a personal voice and working method through intellectual activity and creative work. Emphasizes ability to explore concepts, develop skills, and evolve as a communicator of ideas and photographic artist.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

AVT 653 - Graduate Photography II

Credits: 4 (NR)
An intensive critique class concentrating on the development of creative work with emphasis on articulating responses to others' work, the cultural climate, and issues involved in one's own work as it progresses.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: Continuation of Graduate Photography I. Weekly classes share equal time with critical theory and hands-on studio work. Includes readings, visiting artists and lecturers, and field trips.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4
AVT 654 - Advanced Graduate Photography I

Credits: 4 (NR)
Intensive critique class concentrating on the development of creative work with emphasis on articulating responses to others' work, the cultural climate, and issues involved in one's own work as it progresses.

Prerequisite(s): Admission to the AVT graduate program, AVT 653, or permission of instructor.

Notes: Advanced graduate photography course. Weekly classes share equal time with critical theory and hands-on studio work. Includes readings, visiting artists and lecturers, and field trips.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 655 - Advanced Graduate Photography II

Credits: 4 (NR)
AVT 655, Advanced Graduate Photography II, Advanced independent studio production. Progress tracked and assessed through periodic critical discussions with supervising faculty. Achievement measured by faculty review board at mid-semester and end of term.

Prerequisite(s): AVT 652, or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring.

AVT 662 - Graduate Sculpture I

Credits: 4 (NR)
Intensive studio course that furthers student independence through production of a body of work reflecting interests, including a broader context of social, cultural, and contemporary issues. Emphasizes self-evaluation, critical discussion, reading, and writing.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 663 - Graduate Sculpture II

Credits: 4 (NR)
Intensive studio course that furthers student independence through production of a body of work reflecting interests, including a broader context of social, cultural, and contemporary issues. Emphasizes self-evaluation, critical discussion, reading, and writing.

Prerequisite(s): Admission to the AVT graduate program, AVT 662 or permission of instructor.
AVT 664 - Advanced Graduate Sculpture I

Credits: 4 (NR)
Emphasizes individual creative production and development, with periodic exposure of student's work and ideas to the critical attention of the AVT teaching faculty and other graduate students.

Prerequisite(s): Admission to the AVT graduate program, AVT 663 or permission of instructor.

Notes: Writing and reading components.

AVT 665 - Advanced Graduate Sculpture II

Credits: 4 (NR)
AVT 665, Advanced Graduate Sculpture II, Advanced independent studio production. Progress tracked and assessed through periodic critical discussions with supervising faculty. Achievement measured by faculty review board at mid-semester and end of term.

Prerequisite(s): Advanced Graduate Sculpture I, or permission of the instructor.

When Offered: Fall, Spring.

AVT 667 - Two-Dimensional Art Making: Form, Theme, and Context

Credits: 3 (NR)
Through studio work and research on basic and innovative drawing strategies, students explore expressive visual qualities, composition, and color. Students develop professional portfolios that incorporate meaningful themes and contexts for developing visual literacy in PK-12.

Prerequisite(s): Admission to the MAT program and permission of the instructor based on a portfolio review.

AVT 668 - Three-Dimensional Art Making across Cultures
Credits: 3 (NR)
Explores the diversity of art forms in world cultures and work of traditional and contemporary artists. Students learn basic three-dimensional art-making techniques, including ceramics and fibers, and learn to design three-dimensional art instruction for PK-12 levels.

Prerequisite(s): Admission to the MAT program or Art Education Concentration ASTL; or permission of the art education director.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 669 - Four Dimensional Art Making: Technology and New Media

Credits: 4 (NR)
Develops teacher skills for the application of advanced technology for the PK-12 art program and examines the changing nature and uses of technology for expanding visual literacy through pedagogical strategies.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

AVT 670 - Teaching Practicum

Credits: 2 (RD)
Supervised classroom teaching practicum in Mason’s undergraduate program or community college program.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: May be repeated for total of 4 credits.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Graduate Special

AVT 672 - Performance Studio I

Credits: 4 (NR)
Introductory studio course looking at performance as a visual art practice and focusing on time, space and the body. Emphasizes artist as performer. Students study the work of performance practitioners, make short performance pieces, document and exhibit their work, and go to galleries and performances locally and in New York.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: Substantial research project required.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4
AVT 673 - Performance Studio II

Credits: 4 (NR)
In-depth studio course focusing on collaborative practice of performance art. Analyzes creation and production processes from an interdisciplinary perspective in conjunction with practical training in multimedia performance, complemented by screenings, readings, guest artists, and field trips.

Prerequisite(s): AVT 672 or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 674 - Advanced Performance Studio

Credits: 4 (NR)
Advanced laboratory for creating and producing performance art. Emphasizes new technologies and their applications, multimedia scriptwriting and storyboarding, and the creation of audiovisual performance. Students work independently and also contribute to collaborative production.

Prerequisite(s): AVT 673 or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 675 - Advanced InterArts Topics

Credits: 4 (NR)
Opportunity for advanced study in interdisciplinary arts topics including African American experience in the performing arts, cyberpunk, global motion, interarts figures, live movies, writing and performance.

Prerequisite(s): AVT 673 or permission of instructor

Notes: May be repeated for maximum 15 credits when taken under different topics.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 2

AVT 676 - Graduate Sound Art

Credits: 4 (NR)
Assuming basic competency in digital audio production and within the theory of sounded experience, students will be assisted in the incorporation of sonic material into their graduate research projects.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.
AVT 678 - Interface and CD-ROM Design

Credits: 5 (NR)
Combined lecture and studio course in multimedia interface and CD-ROM design. Focuses on exporting traditional visual and aural artistic aesthetic to the computer environment within a multimedia context. Assigned class readings augmented and supported by presentations of various digital interfaces and CD-ROM examples. Discusses commercial, entertainment, and educational titles, as well as CD-ROM experimental art works. Studio time divided between AVT labs and area multimedia facilities. Students conceive, design, and develop two CD-ROM or kiosk interfaces due at midterm, and complete a dual platform CD-ROM project due at semester end.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

AVT 682 - Experimental 2D Animation

Credits: 4 (NR)
Designed to broaden range of visually expressive, time-based media from cell animation and stop motion animation to rotoscoping and two-dimensional digital animation. Emphasizes idea generation, concept development, and visual aesthetics.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

AVT 684 - Advanced Image Making

Credits: 4 (NR)
Overview of two-dimensional computer-imaging applications in the arts, including painting, printmaking, mixed media, illustration, video, and animation. Lectures combine technical and aesthetic material, including image processing for artists and color reproduction. Emphasis on developing advanced studio portfolio.

Prerequisite(s): Admission to AVT Graduate Program.

AVT 685 - Video Art
Credits: 4 (NR)
Explores video as medium that is transforming art and is transformed by art. Emphasizes developing an approach to personal narrative, creative skills, and construction of meaning, as well as on acquiring technical skills.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 686 - Experimental 3D Animation

Credits: 4 (NR)
Teaches how to create realistic, three-dimensional scenes with scaled objects, surface textures, lights, and shadows. Emphasizes idea generation, concept development, visual aesthetics, and technical abilities. Students required to render a portfolio of high-resolution images.

Prerequisite(s): Admission to AVT Graduate Program.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

AVT 687 - Advanced Topics: New Media

Credits: 4 (NR)
Advanced course in digital media, including layer compositing, digital video editing, rotoscoping, and cell animation. Emphasizes integrating traditional techniques with software applications; and publishing projects to CD-ROM, DV tape, DVD, and Internet.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6

AVT 688 - Hybrid Animation

Credits: 4 (NR)
Study of digital two-dimensional and three-dimensional animation practices. Introduces lighting, camera movement, object motion, timing, and texture mapping as students plan and produce a short animation. Emphasizes idea generation, concept development, visual aesthetics, and technical abilities.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4
AVT 691 - Elementary Art Education

Credits: 3 (NR)
Concepts and methods in early childhood and elementary art education.

Prerequisite(s): Admission to the MAT program and permission of instructor.

Notes: Students spend three hours per week in class and one hour per week in required field experience in public schools and other educational settings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

AVT 692 - Secondary Art Education

Credits: 3 (NR)
Concepts and methods in secondary art education.

Prerequisite(s): AVT 691 or permission of instructor.

Notes: Students spend three hours per week in class and one hour per week in required field experience in the public schools and other educational settings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

AVT 693 - Apprenticeship

Credits: 3 - 6 (RT)
Apprenticeship at a local business conforming to students' interests in visual information technologies.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: May be repeated for total 6 credits.

Hours of Lecture or Seminar per week: 3 or 6
Hours of Lab or Studio per week: 0

AVT 694 - Advanced Studies in Teaching Critical Response to Art, PK-12

Credits: 3 (NR)
Develops visual literacy and critical thinking skills by examining diverse theoretical models and applying strategies to expand knowledge about art and artifacts in the PK-12 classroom and museum.

Prerequisite(s): Admission to the Art Education concentration ASTL and/or permission of the art education director.
AVT 695 - Internship in Art Education (Student Teaching)

Credits: 5 (NR)
Full-time internship in which students teach in elementary and secondary schools with guidance from cooperating mentor teachers. College supervisors make periodic site visits to observe, assess, and evaluate progress.

Prerequisite(s): Completion of all other MAT program requirements.

Corequisite(s): AVT 696.

AVT 696 - Internship for Student Teachers

Credits: 1 (NR)
Weekly professional seminar focused on needs and concerns of student teachers. Covers issues as they emerge in practice, and concludes with an "Art of Teaching Art" exhibit of work by students of preservice teachers.

Corequisite(s): AVT 695.

AVT 697 - Advanced Strategies and Curricular Innovations in the Visual Arts

Credits: 3 (NR)
Synthesizing knowledge and understandings gained in ASTL program, seminar focuses on innovative curriculum design, mastery of effective instructional strategies, and developing leadership potential for the field of visual art education.

Prerequisite(s): Completion of all ASTL art education concentration courses.

AVT 698 - Ind Study/Directed Readings

Credits: 1-3 (RD)
Prerequisite(s): Admission to the MAT or Art Education Concentration,(ASTL) and permission of art education director.
AVT 794 - Independent Design Project

Credits: 4 (NR)
The capstone course in the graphic design Master of Arts degree. Provides for the independent development, design, production and presentation of a graduate-level design project guided by faculty and design professionals.

Prerequisite(s): Admission to the AVT Graphic Design graduate program and completion of 30 graduate credits.

AVT 796 - Directed Reading

Credits: 1 (NR)
The development of independent research into the historical precedents, theoretical underpinnings, cultural forms, and idea territories pertinent to student's individual studio practice. Individualized section under the direction of division member.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: One of three courses comprising the MFA comprehensive experience for AVT students.

AVT 798 - Directed Project and Exhibition

Credits: 1-7 (RD)
The construction and presentation of a professional-quality public exhibition. Course includes significant independent studio production of a comprehensive body of work, leading to the MFA Thesis Exhibition. Exhibition must demonstrate student's mastery of studio craft and concept. Individualized section under the direction of division member.

Prerequisite(s): Admission to AVT graduate program or permission of instructor.

Notes: One of three courses comprising the MFA comprehensive experience for AVT students.

AVT 799 - Thesis
The written thesis informs, documents, and enhances the MFA thesis exhibition, which is the student's primary creative research activity. The content of the written thesis may vary in accordance with artistic discipline and final exhibition. Individualized section under the direction of division member.

**Prerequisite(s):** Admission to AVT graduate program or permission of instructor.

**Notes:** One of three courses comprising the MFA comprehensive experience for AVT students.

- **Hours of Lecture or Seminar per week:** 1-6
- **Hours of Lab or Studio per week:** 0
- **Grading:** Satisfactory/No credit only

### Arts Management (AMGT)

Offered by the College of Visual and Performing Arts

#### AMGT 402 - Professional Development

Credits: 1 (NR)

Seminar course that involves the development of workplace frameworks for success.

**Prerequisite(s):** Junior standing, admission to the arts administration minor, or permission of instructor.

- **Hours of Lecture or Seminar per week:** 1
- **Hours of Lab or Studio per week:** 0
- **When Offered:** Fall

#### AMGT 405 - Seminar in Arts Management

Credits: 3 (NR)

Focuses on not-for-profit visual and performing arts organizations. Topics covered include the evolution of the field, the internal culture and structure, external influences, governance, planning, human resources, marketing, fundraising, financial management, economic impact, and other topics. Students will be introduced to a wide range of arts organizations, working arts administrators, and institutional models through field trips, guest lectures, readings, and institutional data.

**Prerequisite(s):** Junior standing, admission to arts administration minor, or permission of instructor.

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0
- **When Offered:** Spring

#### AMGT 470 - Academic Writing in the Arts
Credits: 1 (NR)
Prepares students for rigors of academic writing within the arts management fields. Students learn how to analyze the rhetorical situation before writing: assignment, topic, purpose, audience, and organization. Includes principles of academic research, writing, and citation; each assignment is designed to encourage students to think critically about their own writing and to practice patterns of review, assessment, reflection, and revision.

Prerequisite(s): Junior standing, admission to the arts administration minor, or permission of the instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AMGT 471 - Introduction to Grant Writing

Credits: 1 (NR)
Course focuses on developing the skills necessary for successful grant applications for arts organizations. Study of relevant funding sources, awareness of available research materials, ability to construct coherent proposals, and defining fund-raising strategy for an arts organization.

Prerequisite(s): Junior standing, admission to the arts administration minor, or permission of the instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Summer

AMGT 489 - Internship in Arts Management

Credits: 1-4 (RD)
Apprenticeship, internship, or project with organization or individual in the arts. Must be prearranged with the minor coordinator before enrollment.

Prerequisite(s): Junior Standing, completion of 6 credits of courses in area of residency, AMGT 305, or permission of instructor.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

AMGT 504 - Professional Development Arts Management

Credits: 1 (NR)
Combines experimental facets happening within the creative community and the development of an increasing awareness of self. Professional development is not only for the manager, but also for those who work for that manager. It is collaborative, ideally incorporating an evaluative stage. Topics addressed include professional development, consultation, coaching, communities of practice, lesson study, mentoring, reflective supervision and technical assistance.

Prerequisite(s): Admission to Arts Management program or permission of program director.
AMGT 505 - Academic Writing in Arts Management

Credits: 1 (NR)
Course prepares students for the rigors of academic writing at the advanced level and supports their becoming acculturated in the academic writing skills and practices within their discourse communities. Students will learn how to analyze the rhetorical situation before writing: assignment, topic, purpose, audience, and organization and will include the principles of academic research, writing, and citation.

AMGT 511 - Introduction to Grant Writing

Credits: 1 (NR)
Places components of grant writing process within broader context of nonprofit management. Introduction to perspectives of grant seeker and maker. The grant writing process: research, proposal writing, terminology, oral and written techniques, and specific focus. Discover resources and compelling writing skills pertaining to proposal and letters of intent.

Prerequisite(s): Admission to Arts Management program or permission of program director.

AMGT 525 - Introduction to Technology for PR and Marketing in the Arts

Credits: 1 (NR)
Introduces students to software packages current in Public Relations and Marketing and demonstrates their value for specific applications in Arts Management. Students also will learn about the direct costs, licensing, infrastructure, and advanced training necessary for effectively managing these resources. This course may be taken alone or with AMGT 526.

Prerequisite(s): Admission to Arts Management program or permission of program director.

AMGT 526 - Applied Technology Projects for PR and Marketing in the Arts
AMGT 525 - Introduction to Technology for Programming and Project Management in the Arts

Credits: 1 (NR)
Introduces students to software packages current in Project Management and demonstrates their value for specific applications in Arts Management. Students also will learn about the direct costs, licensing, infrastructure, and advanced training necessary for effectively managing these resources. This course may be taken alone or with AMGT 546.

Prerequisite(s): Admission to Arts Management program or permission of program director.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

AMGT 546 - Applied Technology Projects for Programming and Project Management in the Arts

Credits: 1 (NR)
Allows students to employ and expand their knowledge of one software package current in Project Management. Under the direction of faculty, each student will identify a specific application in Arts Management to test that package.

Prerequisite(s): AMGT 545 or permission of program director.
AMGT 547 - Selected Readings for Programming and Project Management in the Arts

Credits: 1 (NR)
Introduces students to the intellectual foundations of the practice of Programming and Project Management as well as providing an opportunity to think critically about the field as it relates specifically to the arts. The course will consider ethical practices and professional responsibilities of professional arts managers working in this specialty.

Prerequisite(s): Admission to Arts Management program or permission of program director.

AMGT 555 - Introduction to Technology for Fundraising and Development in the Arts

Credits: 1 (NR)
Introduces students to software packages current in Fundraising and Development and demonstrates their value for specific applications in Arts Management. Students also will learn about the direct costs, licensing, infrastructure, and advanced training necessary for effectively managing these resources. This course may be taken alone or with AMGT 556.

Prerequisite(s): Admission to Arts Management program or permission of program director.

AMGT 556 - Applied Technology Projects for Fundraising and Development in the Arts

Credits: 1 (NR)
Allows students to employ and expand their knowledge of one software package current in Fundraising and Development. Under the direction of faculty, each student will identify a specific application in Arts Management to test that package.

Prerequisite(s): AMGT 555 or permission of program director.

AMGT 557 - Selected Readings for Fundraising and Development in the Arts
Introduces students to the intellectual foundations of the practice of Fundraising and Development as well as providing an opportunity to think critically about the field as it relates specifically to the arts. The course will consider ethical practices and professional responsibilities of professional arts managers working in this specialty.

**Prerequisite(s):** Selected Readings for Fundraising and Development in the Arts.

**AMGT 599 - Special Topics in Arts Management**

Credits: 1-6 (RD)
Provides opportunity to explore special and timely topics in arts management including theoretical and applied areas. Topics and credit vary; may be repeated for up to 12 credits taken under different topics.

**Prerequisite(s):** Admission to Arts Management program or permission of program director.

**AMGT 601 - Fund Raising/Development I**

Credits: 3 (NR)
Overview for students seeking general knowledge, as well as introductory course for those who will complete the fund-raising concentration. Teaches role of fund raising as management function and part of overall strategic intention of arts organizations, presenting fund raising as a multifaceted, team-based process. Analyzes tools and techniques for effective fund raising.

**Prerequisite(s):** Admission to Arts Management program or permission of program director.

**AMGT 602 - Seminar in Arts Management**

Credits: 3 (NR)
Develops tools and techniques necessary for successful pursuit of a management career in visual and performing arts. Introduces wide range of arts organizations, working arts administrators, and institutional models through guest lectures, readings, field trips, and analysis of institutional data. Students gain understanding of organizational structures and functions, as well as models for general management.

**Prerequisite(s):** Admission to Arts Management program or permission of program director.
AMGT 603 - Arts and Society

Credits: 3 (NR)
Examines role of visual and performing arts, with emphasis on historic traditions and trends that have most directly influenced contemporary American practice. Consideration is given to the functions of art in society in addressing questions: What constitutes good or bad art? What is the value of art? What encouragements or impediments does our society offer to the creative artist or arts institution?

Prerequisite(s): Admission to Arts Management program or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

AMGT 604 - Public Relations and Marketing Strategies for the Arts I

Credits: 3 (NR)
Teaches strategic way of thinking about audience, community, and markets. Structured into four modules, beginning with fundamentals of strategic planning. Students learn about external and internal environments and the interplay among them; discuss marketing fundamentals pertaining to arts audiences; and are introduced to fundamentals of applied marketing media and advertising fundamentals.

Prerequisite(s): Admission to Arts Management program or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

AMGT 606 - Board of Directors Management

Credits: 3 (NR)
Board development including oversight and management of a board, as well as understanding board functions. Board relationships, including volunteers, are essential through all of the stages of a management career.

Prerequisite(s): Admission to Arts Management program or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AMGT 607 - Fund Raising/Development II
Focus on two active arts organizations and create a development plan and various proposals specifically geared to their situations. The course focuses on practical application of development principles, writing and communications skills, and strategic thinking and planning.

Prerequisite(s): AMGT 601 or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

AMGT 608 - Public Relations and Marketing Strategies for the Arts II

Credits: 3 (NR)
Conception, planning, and implementation and control of platforms to create and manage a holistic communications strategy for arts organizations. This includes management of brand, public relations, advertising and the evolving marketplace: new technologies, and theories in marketing.

Prerequisite(s): AMGT 604

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

AMGT 609 - Facilities Management

Credits: 3 (NR)
Bridging strategic planning and marketing; audience development; financial management; and board and volunteer management with issues of scheduling, ticketing and sales, mission integration and strategic challenges of new facilities, and growth and operations of existing ones.

Prerequisite(s): Admission to Arts Management program or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AMGT 610 - Gallery Management

Credits: 3 (NR)
Covers the many facets of visual art gallery management, from practical considerations of daily operations to the broader examination of gallery’s role in art education, criticism, and art market. Topics such as exhibition coordination and installation, contracts, artist representation, fine art insurance, exhibition policies, budgets, and marketing are covered, along with the responsibility of educating a diverse public.

Prerequisite(s): Admission to Arts Management program or permission of program director.
AMGT 620 - Legal Aspects in Arts Management

Credits: 3 (NR)
This course is an overview of practical legal issues that will be encountered by arts managers of both for-profit and not-for-profit arts organizations, including contracts, copyrights, licensing, and for-profit and non-profit incorporation.

Prerequisite(s): Admission to Arts Management program or permission of program director.

AMGT 630 - Viral Marketing and Social Media for the Arts

Credits: 3 (NR)
This course focuses on Internet marketing, online implementation of a marketing plan across multiple platforms, and integration between an arts organization’s online and offline marketing strategies. We will cover: Word of Mouth and Buzz marketing; Websites and Blogs; and Social Media. The course explores how to develop and implement cost effective viral marketing strategies that instill a unique branding element.

Prerequisite(s): Admission to Arts Management program or permission of program director.

AMGT 640 - Programming and Project Management in the Arts

Credits: 3 (NR)
Arts managers make decisions about what arts services to offer, and these decisions must balance artistic mission, available resources, and community need. Programming and Project Management in the Arts provides both a theoretical framework for thinking about and assessing the value of various programming options, and practical examples of the potential partners and resources available for program and project implementation.

Prerequisite(s): Admission to Arts Management program or permission of program director.
AMGT 650 - Major Gifts and Capital Campaigns

Credits: 3 (NR)
Arts organizations have special challenges and opportunities securing major gifts and planning and executing a successful capital campaign. This course will focus on the art and science of identifying, cultivating, soliciting and stewarding major gift and capital campaign prospects and donors, and how these efforts differ from annual fundraising. The course highlights the “values exchange” model of development and fundraising.

Prerequisite(s): AMGT 601 or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

AMGT 704 - Finance and Budgeting for Arts I

Credits: 3 (NR)
Introduces budget and finance as fundamentals of the budget process, specifically tailored to needs of arts organizations. Provides overview of accounting as tool to manage and control arts organizations. Involves laboratory component for teaching software application frequently encountered in fiscal operation of arts organizations.

Prerequisite(s): Admission to Arts Management program or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AMGT 705 - Finance and Budgeting for Arts II

Credits: 2 (NR)
Introduces budgeting, planning, and finance as fundamentals of the strategic planning process and management control, specifically tailored to the needs of arts organizations.

Prerequisite(s): AMGT 704

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

AMGT 706 - Festivals and Special Events

Credits: 3 (NR)
Technical aspects of events and festival management. Topics such as cultural understanding, tourism, sponsorship, fund raising and development, logistics of scheduling and contracts, and the relationship to larger venues, marketing and sales, and budgeting.

Prerequisite(s): Admission to Arts Management program or permission of program director.
AMGT 710 - Arts Policy

Credits: 3 (NR)
Reviews current state of the sector, familiarizing students with most common rationales for public support of the arts and respective roles of federal, state, and local governments and private policy actors. Examines dilemmas that arts organizations face in balancing need for government support and artistic integrity with push and pull of the market. Compares U.S. policies to other developed countries.

Prerequisite(s): Admission to Arts Management program or permission of program director.

AMGT 711 - Directed Readings and Project

Credits: 1-6 (RD)
Opportunity to engage in a more intensive study or project in arts management. Students partner with faculty member for intensive readings and project in strategy and planning in the arts, fundraising and development, entrepreneurial project work, arts marketing, arts policy and law, or other specialized areas pertinent to arts administration.

Prerequisite(s): Admission to Arts Management program or permission of program director.

AMGT 712 - Grant Writing in the Arts

Credits: 3 (NR)
Places components of grant writing process within broader context of nonprofit management. Introduction to perspectives of grant seeker and maker. The grant writing process: research, proposal writing, terminology, oral and written techniques, and specific focus. Discover resources and compelling writing skills pertaining to proposal and letters of intent.

Prerequisite(s): Admission to Arts Management program or permission of program director.
AMGT 740 - Internal Internship

Credits: 2 (NR)
Builds on apprenticeship as a core means of teaching applied concepts of arts management. Augments use of Center of the Arts and active arts environment, both performing and visual, as a learning laboratory. Builds on practical learning and provides internal training as preparation for external internship. Minimum 42 hours/credit.

Prerequisite(s): Admission to Arts Management program or permission of program director. 9-credit standing.

Notes: 9 credits taken within the master in arts management program; or permission of program director. Required for developing practical application.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 6
When Offered: Fall, Spring, Summer

AMGT 750 - Arts Entrepreneurship I

Credits: 3 (NR)
Lecture course in discovering and developing entrepreneurial skills in the artist. The course includes presentations, lectures, and meetings with successful art and non-art entrepreneurs in the region. Students will conceive, develop, and present a for-profit or not-for-profit business plan strategy, which includes model(s), market overview, management structure, along with revenue streams, an acquisition strategy, and technical and information technology strategies.

Prerequisite(s): Admission to Arts Management program or permission of program director.

Notes: The semester concludes with a 15- to 20-minute public presentation of the business plan summary before a panel of entrepreneurs and business and nonprofit managers.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AMGT 751 - Arts Entrepreneurship II

Credits: 3 (NR)
Advanced lecture course in discovering and developing entrepreneurial skills in the artist. Special focus on developing business financial planning skills, funding strategy, and marketing and sales of the arts. Course includes presentations, lectures, and meetings with successful entrepreneurs in the region. Students will conceive, develop, and present statements and projections consistent with the development of a business plan.

Prerequisite(s): AMGT 750 or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
AMGT 760 - Current Issues in Arts Management

Credits: 3 (NR)
Strategic decision making within the complex web of social, political, economic, personal, and ethical dimensions. Analysis of cases, using learned skills in planning, financial and strategic analysis, human resource allocation, and fundraising.

Prerequisite(s): Admission to Arts Management program, 9-credit standing; or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

AMGT 780 - Arts Consultancy

Credits: 3 (NR)
Studies techniques, frameworks for selecting and using consultants effectively. Incorporates business development, project scope, contract and pricing, and independent contractor as opportunities in arts management field.

Prerequisite(s): Admission to Arts Management program or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

AMGT 790 - External Internship

Credits: 1-4 (RD)
Designed to follow internal internship. Provides a specific work environment to build on skills developed in the classroom, and integrates work experience with specific academic exercises. Students advised to pursue a three-pronged approach toward specialization: electives; internal internship in the same area as concentrated electives; and external internship consistent with specialized course work and internal internship. Minimum 42 hours/credit.

Prerequisite(s): Admission to Arts Management program, 15 credit standing; or permission of program director.

Notes: 15 credits taken within the master in arts management program; or permission of program director. Required for developing practical application.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 6-12
When Offered: Fall, Spring, Summer

AMGT 795 - Capstone in Arts Management

Credits: 1 (NR)
Students are required to complete a capstone project in order to complete the MA AMGT degree. The purpose of the capstone is to provide students with the opportunity to deepen, expand and demonstrate mastery of one area of arts management expertise.
The capstone will expand on work undertaken in a completed AMGT course or internship. Faculty will provide guidance and approve capstone topics. The capstone is a required one-credit course. Students may register for the capstone after having completed all core course requirements for the MA AMGT degree.

Prerequisite(s): Students may register for the capstone after having completed all core course requirements for the MA AMGT degree.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Spring.

Astronomy (ASTR)

Offered by the College of Science

ASTR 103 - Astronomy

Credits: 3 (NR)
Introduction to origin of life, Earth, planets and sun, stars, galaxies, quasars, nature of space radiation, and general theory of relativity.

Fulfills general education requirement in natural science (nonlab).

Notes: Not for physics majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 111 - Introductory Astronomy: The Solar System

Credits: 3 (NR)
Topics include history of astronomy, evolution of the solar system, properties of planets, scientific method, critical thinking, nature of light, and principles of telescope design.

Fulfills general education requirement in natural science (lab).

Notes: ASTR 111 and 112 can be used to fulfill a 4-credit lab science requirement; not for physics majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 112 - Introductory Astronomy Lab: The Solar System
Credits: 1 (NR)
Laboratory course associated with ASTR 111.

Fulfills general education requirement in natural science (lab).

Notes: ASTR 111 and 112 can be used to fulfill a 4-credit lab science requirement; not for physics majors.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 3

ASTR 113 - Introductory Astronomy: Stars, Galaxies, and the Universe

Credits: 3 (NR)
Topics include electromagnetic radiation, stellar evolution, interstellar medium, galaxies, cosmology, scientific method, and critical thinking.

Fulfills general education requirement in natural science (lab).

Notes: ASTR 113 and 114 can be used to fulfill a 4-credit lab science requirement; not for physics majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 114 - Introductory Astronomy Lab: Stars, Galaxies, and the Universe

Credits: 1 (NR)
Laboratory course associated with ASTR 113.

Fulfills general education requirement in natural science (lab).

Notes: ASTR 113 and 114 can be used to fulfill a 4-credit lab science requirement; not for physics majors.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 3

ASTR 301 - Astrobiology

Credits: 3 (NR)
Physical science perspective on origin and evolution of life on Earth and how life, in turn, has significantly influenced Earth's evolution. Topics include origin of Earth, mechanisms and sites for origin of life, co-evolution of life and Earth's atmosphere, habitability of planets, and the search for extraterrestrial life.

Prerequisite(s): MATH 108 or 113; PHYS 160 or 243.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ASTR 302 - Foundations of Cosmological Thought

Credits: 3 (NR)
Examines scientific, historical, and philosophical foundations and development of cosmological thought from antiquity to the present. Emphasizes qualitative understanding of the development of cosmology concluding with the present concept of origin and evolution of universe.

Fulfills general education requirement in natural science (nonlab).

Notes: No advanced background in mathematics or natural sciences required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 328 - Stars and Interstellar Medium

Credits: 3 (NR)
Stellar structure and evolution; radiative transfer; the interstellar medium. The course includes computational work. Previous programming experience is not required, as it will be developed in the course, but it is helpful.

Equivalent to PHYS 328

Prerequisite(s): PHYS 262 and MATH 214.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 390 - Topics in Astronomy

Credits: 1-4 (RT)
Selected topics not covered in fixed-content courses.

Notes: May not be included for credit by physics majors in the 45 credits of physics courses required for BS degree, or in 31 credits of physics courses required for BA degree.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0

ASTR 401 - Computer Simulation in Astronomy

Credits: 3 (NR)
Techniques and methods to simulate astronomical phenomena using a computer. Examples taken from a wide variety of astronomical phenomena, including radiation transfer in astrophysical objects, self-gravitating systems, hydrodynamics, and stellar models.
Prerequisite(s): MATH 213 and ASTR 328.

Notes: Emphasizes hands-on projects.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 402 - Methods of Observational Astronomy

Credits: 3 (NR)
Collection and analysis of data covering radio, microwave, infrared, visible, ultraviolet, X-ray, and gamma ray astronomy. Topics include electromagnetic spectrum, coordinate systems, motion of celestial objects, telescopes, detectors, statistics and noise, interferometry, and spectroscopy.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ASTR 111, 112, 113, 114.

Notes: This course meets the writing-intensive requirement.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 403 - Planetary Sciences

Credits: 3 (NR)
Introduction to the physics and chemistry of planets and their natural satellites, asteroids, and comets. Topics include history of the solar system; origin and evolution of planets, their internal structure and atmospheres; and analytical techniques used in remote and in situ study.

Prerequisite(s): MATH 213 and PHYS 160.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 404 - Galaxies and Cosmology

Credits: 3 (NR)
The structure of the Milky Way as the basis for our knowledge of galaxies; the properties of galaxies from our local neighborhood out to the youngest galaxies in the far distant universe; observational and theoretical approaches to the structure and evolution of galaxies; the basics of cosmology and the formation of structure in the universe. Computational tools introduced in ASTR 328 are developed further.

Prerequisite(s): MATH 214, ASTR 328, and PHYS 308.
ASTR 405 - Honors Thesis in Astronomy I

Credits: 3 (NR)
Project chosen and completed under the guidance of a faculty member, resulting in a written thesis. An oral progress report is required for ASTR 405.

Prerequisite(s): 21 credit hours in Physics and Astronomy and acceptance into the astronomy honors program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 406 - Honors Thesis in Astronomy II

Credits: 3 (NR)
Project chosen and completed under the guidance of a faculty member, resulting in a written thesis. An oral progress report is required for ASTR 406.

Prerequisite(s): ASTR 405 and 21 credit hours in Physics and Astronomy and acceptance into the astronomy honors program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 408 - Senior Research

Credits: 3 (RD)
Independent work under guidance of faculty member on research project in experimental, observational, or theoretical astronomy.

Prerequisite(s): 15 credits of ASTR courses.

Notes: Students may not receive more than 6 credits of ASTR 408 and 409. Written report on project required. May be taken twice with department permission.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 409 - Astronomy Internship

Credits: 3 (NR)
On-the-job experience for astronomy majors in industry or government laboratories, including summer research programs. Students work in observational, experimental, or theoretical astronomy, and prepare written report at end of internship.
Prerequisite(s): 75 credits, 15 ASTR credits, and permission of department.

Notes: See department for other requirements and application procedure prior to enrollment. Students may not receive more than 6 credits of ASTR 408 and 409.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 428 - Relativity

Credits: 3 (NR)
Special relativity; four-dimensional spacetime; relativistic mechanics; tensors; general relativity; geodesics; Schwarzschild metric; applications of general relativity.

Equivalent to PHYS 428

Prerequisite(s): MATH 214; PHYS 303, 305, and 262; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 532 - Phys Interplanetary Med

Credits: 3 (NR)
Prerequisite(s): PHYS 303, 305, 308; MATH 214.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 535 - Space Instrumentation and Exploration

Credits: 3 (NR)
Survey of instruments, devices, and methods for space and planetary exploration, including remote sensing of Earth and other solar system bodies, and planned manned and unmanned missions by the United States and other countries.

Equivalent to CSI 660

Prerequisite(s): PHYS 262 and MATH 213.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 590 - Selected Topics in Astronomy and Astrophysics
Credits: 1-6 (RD)
Advanced topics from recent theoretical or observational developments and their applications. Satisfies needs of professional community to keep abreast of current developments.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 0-6
Hours of Lab or Studio per week: 0

ASTR 602 - Methods of Observational Astronomy

Credits: 3 (NR)
Collection and analysis of data covering radio, microwave, infrared, visible, ultraviolet, X-ray, and gamma ray astronomy. Topics include electromagnetic spectrum, coordinate systems, motion of celestial objects, telescopes, detectors, statistics and noise, interferometry, and spectroscopy. The course makes extensive use of computational methods.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

ASTR 603 - Planetary Sciences

Credits: 3 (NR)
Equivalent to ASTR 703 (2010-2011 Catalog)

Prerequisite(s): MATH 213 and PHYS 262

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ASTR 604 - Galaxies and Cosmology

Credits: 3 (NR)
The structure of the Milky Way as the basis for our knowledge of galaxies; the properties of galaxies from our local neighborhood out to the youngest galaxies in the far distant universe; observational and theoretical approaches to the structure and evolution of galaxies; the basics of cosmology and the formation of structure in the universe.

Prerequisite(s): ASTR 328 and MATH 214.

Corequisite(s): PHYS 308.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring
ASTR 628 - Relativity

Credits: 3 (NR)
Equivalent to ASTR 766 (2010-2011 Catalog)

**Prerequisite(s):** MATH 214, PHYS 262, 303, 305.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Spring

ASTR 660 - Plasma Physics for Space and Astrophysics

Credits: 3 (NR)
Equivalent to PHYS 660

**Prerequisite(s):** PHYS 305

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall

ASTR 680 - Physics of Interstellar Media

Credits: 3 (NR)
Physical processes in the interstellar media. Topics include the production and transfer of radiation, ionization and recombination, atomic and molecular excitation, dust physics, gas heating and cooling, and star formation.

**Prerequisite(s):** PHYS 402 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

ASTR 730 - Stellar Astrophysics

Credits: 3 (NR)
Survey of contemporary astrophysics. Topics include physical concepts, stellar spectra, Hertzsprung-Russell diagram, stellar atmospheres, stellar structure, interstellar matter, stellar evolution, high-energy phenomena, hydrodynamical processes in astrophysics, accretion disk formation, and shock formation.

Equivalent to ASTR 530 (2010-2011 Catalog)

**Prerequisite(s):** MATH 214, PHYS 303, 305, 308.

**Hours of Lecture or Seminar per week:** 3
**ASTR 761 - N-Body Methods and Part Sim**

Credits: 3 (NR)
Covers particle methods to solve variety of physical systems. Emphasizes study and development of numerical results, and visualization of these results in complex physical systems. Applications and projects include stellar and galaxy dynamics, smoothed particle hydrodynamics, plasma simulations, and semiconductor device theory algorithms on parallel and vectorized systems.

Equivalent to CSI 761

**Prerequisite(s):** PHYS 613 and CSI 717 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ASTR 764 - Computational Astrophysics**

Credits: 3 (NR)
Covers statistical mechanics concepts important in astrophysics. Presents unified approach to particle acceleration and interaction theory based on analytical and numerical analysis of Boltzmann and Liouville equations. Discusses computational methods relevant to particle transport problems, with emphasis on Fokker-planck and Monte Carlo solution techniques. Applications from space sciences include studies of cosmic ray acceleration, photon comptonization, particle transport in the near-Earth environment, energy transport in stellar atmospheres, and self-gravitating system dynamics.

Equivalent to CSI 764

**Prerequisite(s):** ASTR 530, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ASTR 765 - High-Energy and Accretion Astrophysics**

Credits: 3 (NR)
Overview of the field of atomic and nuclear physics, including nuclear reactions of use to high-energy astrophysics. Discusses radiation processes in cosmic plasmas emphasizing quantum mechanical calculations; stellar evolution and nucleosynthesis; computational models of stellar evolution; binary stars and accretion disks; numerical models of the structure of accretion disks; compact stars, white dwarfs, neutron stars, and black holes; acceleration processes and cosmic rays; interstellar medium and propagation of cosmic rays; high-energy processes in the center of galaxies; and ground- and space-based techniques and observations.

Equivalent to CSI 765

**Prerequisite(s):** PHYS 502 and 513, and ASTR 530; or permission of instructor.
ASTR 769 - Topics in Space Sciences

Credits: 3 (NR)
Selected topics in space sciences not covered in fixed-content space sciences courses.

Equivalent to CSI 769

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as needed.

ASTR 790 - Advanced Topics in Astronomy and Astrophysics

Credits: 1-6 (RD)
Advanced topics from recent theoretical or observational developments and applications.

Prerequisite(s): Graduate standing and permission of instructor.

Notes: Satisfies need of professional community to keep abreast of current developments.

ASTR 796 - Directed Reading and Research

Credits: 1-6 (RD)
Reading and research on a specific topic in astronomy, astrophysics, or related field under direction of faculty member.

Prerequisite(s): Admission to master's program and permission of instructor.

Notes: May be repeated as needed.

ASTR 798 - Research Project
Credits: 3 (NR)
Research project chosen and completed under guidance of graduate faculty member resulting in an acceptable technical report.

Prerequisite(s): 9 credits and permission of instructor.

Notes: May not be repeated.

ASTR 799 - Master's Thesis

Credits: 1-6 (RD)
Research project chosen and completed under guidance of graduate faculty member resulting in acceptable technical report and oral defense acceptable to three-faculty-member thesis committee.

Prerequisite(s): 9 credits, and permission of instructor.

Notes: May not be repeated.

ASTR 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Covers development of a research proposal under the guidance of a dissertation director and the doctoral committee. The proposal forms the basis for the doctoral dissertation.

Prerequisite(s): Admission to physics doctoral program and permission of advisor.

Notes: May be repeated as needed; however, no more than 24 credits in ASTR/PHYS 998 and ASTR/PHYS 999 may be applied toward satisfying doctoral degree requirements in the physics PhD program. Out of the 24, no more than 12 credits of ASTR/PHYS 998 may be applied.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

ASTR 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral research performed under direction of dissertation director.

Prerequisite(s): Admission to doctoral candidacy in physics doctoral program and permission of advisor.
Notes: May be repeated as needed; however, no more than 24 credits in ASTR/PHYS 998 and ASTR/PHYS 999 may be applied toward satisfying doctoral degree requirements in the physics PhD program.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/IP

Athletic Training (ATEP)

Offered by the College of Education and Human Development

ATEP 150 - Introduction to Athletic Training and Preventative Care Techniques

Credits: 3 (NR)
Introduces the profession of athletic training and the basic principles of preventative care commonly used in the profession. Topics will include athletic training facility organization and procedures; protective sports equipment; construction of protective devices; and application of protective taping, braces, wrapping, and protective pads. Areas to be studied include the role of the athletic trainer in sports medicine, mechanisms of athletic injuries, tissue response to injury, blood-borne pathogens, introductory techniques of the assessment and evaluation of athletic injuries and emergency procedures.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2

ATEP 180 - Emergency Medical Care for Physically Active Populations

Credits: 0-4 (NR)
An investigation of the scientific and philosophical foundations of pre-hospital emergency care principles pertinent to a physically active population. Students develop knowledge, critical thinking, and problem solving skills necessary to correctly apply emergency care principles and associated skills in a variety of clinical and professional settings. Upon successful completion of this course, the student will earn Emergency Cardiac Care (ECC) and First Aid certifications.

Prerequisite(s): BIOL 124

Corequisite(s): BIOL 125

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

ATEP 201 - Medical and Scientific Terminology

Credits: 3 (NR)
Foundations of scientific and medical vocabulary including prefixes, suffixes and stems used to form compound words.

Hours of Lecture or Seminar per week: 3
ATEP 203 - Prevention, Recognition, and Management of Athletic and Fitness Related Injuries

Credits: 3 (NR)
Provides coaches and fitness professionals with theory on the prevention, recognition, and management of injuries and conditions that occur in athletic competition and recreational fitness activities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ATEP 205 - Cultural Competence

Credits: 3 (NR)
Explores cultural competence and its integration for effective professional practice. Includes communication styles, daily living practices, common sensitivities, self-awareness, and historical cultural implications in multicultural environments.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ATEP 250 - Physical Assessment of the Lower Body

Credits: 3 (NR)
An analysis of the principles of physical assessment of the lower body.

Prerequisite(s): ATEP 150, 180; BIOL 124, 125; HEAL 110; PHED 300

Corequisite(s): Concurrently enrolled in ATEP 255, ATEP 256

Notes: Formal acceptance to the professional phase of the ATEP.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 255 - Clinical Techniques I: Physical Assessment of the Lower Body

Credits: 3 (NR)
An analysis of physical assessment clinical techniques of the lower body (including the lower extremity and abdomen).

Prerequisite(s): ATEP 150, ATEP 180, BIOL 124, BIOL 125, HEAL 110, and PHED 300
Corequisite(s): Concurrently enrolled in ATEP 250 and ATEP 256

Notes: Formal acceptance to the professional phase of the ATEP.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 256 - Practicum I: Physical Assessment of the Lower Body

Credits: 3 (NR)
A clinical practicum filed experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on physical assessment of the lower body.

Prerequisite(s): ATEP 150, 180; BIOL 124, 125; HEAL 110; and PHED 300

Corequisite(s): Concurrently enrolled in ATEP 250 and 255

Notes: Formal acceptance to professional phase of the ATEP; Current Emergency Cardiac Care (ECC) Certification.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 260 - Physical Assessment of the Upper Body

Credits: 3 (NR)
An analysis of the principles of physical assessment of the upper body.

Prerequisite(s): ATEP 150, 180, 250, 255, 256; BIOL 124, 125; HEAL 110; and PHED 300

Corequisite(s): Concurrently enrolled in ATEP 265, ATEP 266

Notes: Formal acceptance to the professional phase of the ATEP

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 265 - Clinical Techniques II: Physical Assessment of the Upper Body

Credits: 3 (NR)
An analysis of physical assessment clinical techniques of the upper body (including the upper extremity, head, and neck).

Prerequisite(s): ATEP 150, 180, 250, 255, 256; BIOL 124, 125; HEAL 110; and PHED 300

Corequisite(s): ATEP 260, 266

Notes: Formal acceptance to the professional phase of the ATEP
ATEP 266 - Practicum II: Physical Assessment of the Upper Body

Credits: 3 (NR)
A clinical practicum field experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on physical assessment of the upper body.

Prerequisite(s): ATEP 150, 180, 250, 255, 256, BIOL 124, BIOL 125, HEAL 110, and PHED 300

Corequisite(s): ATEP 260 and 265

Notes: Formal acceptance to the professional phase of the ATEP; Emergency Cardiac Care (ECC) Certification

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 270 - General Medical Conditions and Pharmacology in Physically Active Populations

Credits: 3 (NR)
An examination of assessment and management techniques of general medical conditions and pharmacological principles in physically active populations.

Prerequisite(s): ATEP 150 and 180; BIOL 124 and 125; HEAL 110 and 230; PHED 300

Notes: Formal acceptance to the professional phase of the ATEP

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 300 - Functional Anatomy

Credits: 3 (NR)
Increase students’ knowledge and exposure to the structural and functional components of human anatomy including musculoskeletal origins, insertions, actions and innervations.

Prerequisite(s): BIOL 124.

Corequisite(s): BIOL 125.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1
When Offered: Fall, Summer, Spring.
ATEP 350 - Therapeutic Modalities

Credits: 3 (NR)
Study of the physical principles, physiological effects, indications, and contraindications of therapeutic modalities used in athletic training. Also covers indications, contraindications, physiological effects, special programs, and resistance methods used in the prevention and rehabilitation of athletic injuries.

Prerequisite(s): ATEP 150, ATEP 180, ATEP 250, ATEP 255, ATEP 260, ATEP 265, ATEP 266, ATEP 270, BIOL 124, BIOL 125, HEAL 110, HEAL 230, and PHED 300

Corequisite(s): ATEP 355, ATEP 356

Notes: Formal acceptance to the professional phase of the ATEP

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 355 - Clinical Techniques III: Therapeutic Modalities

Credits: 3 (NR)
An examination of the scientific theory and standard operating procedures necessary for the safe application of therapeutic modalities in a physically active patient population.

Prerequisite(s): ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270; BIOL 124, 125; HEAL 110, 230; PHED 300

Corequisite(s): ATEP 350 and 356

Notes: Formal acceptance to the professional phase of the ATEP

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 356 - Practicum III: Therapeutic Modalities

Credits: 3 (NR)
A clinical practicum field experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on therapeutic modalities.

Prerequisite(s): ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270; BIOL 124, 125; HEAL 110, 230; and PHED 300

Corequisite(s): ATEP 350 and 355

Notes: Formal acceptance into the professional phase of the ATEP; Current Emergency Cardiac Care (ECC) Certification

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ATEP 360 - Therapeutic Rehabilitation

Credits: 3 (NR)
A study of the indications, contraindications, physiological effects, special programs, and resistance methods that are used in the prevention and rehabilitation of athletic injuries.

Prerequisite(s): ATEP 150, 180, 250, 255, 260, 265, 266, 270, 350, 355, 356; BIOL 124, 125; HEAL 110, 230; PHED 300, 450

Corequisite(s): ATEP 365 and 366

Notes: Formal acceptance into the professional phase of the ATEP

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 365 - Clinical Techniques IV: Therapeutic Rehabilitation

Credits: 3 (NR)
A study of the indications, contraindications, physiological effects, special programs, and resistance methods that are used in the prevention and rehabilitation of athletic injuries.

Prerequisite(s): Formal acceptance to the professional phase of the ATEP; ATEP 150, 180, 250, 255, 260, 265, 266, 270, 350, 355, 356, BIOL 124 and 125; HEAL 110 and 230; PHED 300 and 450.

Corequisite(s): ATEP 360 and 366

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 366 - Practicum IV: Therapeutic Rehabilitation

Credits: 3 (NR)
A clinical practicum field experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on therapeutic rehabilitation.

Prerequisite(s): ATEP 150, 180, 250, 255, 260, 265, 266, 270, 350, 355, 356; BIOL 124, 125; HEAL 110, 230; PHED 300 and 450

Corequisite(s): ATEP 360 and 365

Notes: Formal acceptance into the professional phase of the ATEP; Current Emergency Cardiac Care (ECC) Certification.
ATEP 441 - Senior Seminar in Athletic Training

Credits: 3 (NR)
Capstone educational experience focusing on current topics in the Athletic Training Profession and career development issues.

Prerequisite(s): ATEP 150, ATEP 180, ATEP 250, ATEP 255, ATEP 256, ATEP 260, ATEP 265, ATEP 266, ATEP 270, ATEP 350, ATEP 355, ATEP 356, ATEP 360, ATEP 365, ATEP 366, ATEP 450, ATEP 456; BIOL 124, BIOL 125; HEAL 110, HEAL 230; PHED 300, PHED 364 and PHED 450

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ATEP 450 - Administration and Management in Athletic Training

Credits: 3 (NR)
This lecture/seminar course will focus on the professional management and administrative issues in athletic training. Organization and administration topics will include the preparation in planning, designing, developing, organizing, implementing, directing, and evaluating an athletic training health care program and facility. Current issues in athletic training related to professional conduct and practice will also be discussed.

Prerequisite(s): ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270, 350, 355, 356, 360, 365, 366; BIOL 124, 125; HEAL 110, 230; PHED 300 and 450

Corequisite(s): ATEP 456

Notes: Formal acceptance into the professional phase of the ATEP.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ATEP 456 - Practicum V: Professional Integration

Credits: 6 (NR)
A clinical practicum field experience under the direct supervision of an Approved Clinical Instructor (ACI) with emphasis on professional skill integration.

Prerequisite(s): ATEP 150, 180, 250, 255, 256, 260, 265, 266, 270, 350, 355, 356, 360, 365, 366; BIOL 124, 125; HEAL 110, 230; PHED 300, 364, and 450

Corequisite(s): ATEP 450

Notes: Formal acceptance into the professional phase of the ATEP; Current Emergency Cardiac Care (ECC) Certification.
ATEP 499 - Independent Study in Athletic Training

Credits: 1-6 (RD)
Study of a topic area in athletic training research, theory, or practice under direction of a faculty member. May be repeated, but not more than 6 total credits may be earned.

Prerequisite(s): 60 credit hours and instructor approval

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

Bachelor of Individualized Study (BIS)

Offered by the College of Humanities and Social Sciences

BIS 300 - Understanding Interdisciplinary Studies

Credits: 3 (NR)
Focuses on literature and issues relevant to interdisciplinary and multidisciplinary studies and the BIS program. Students explore selected topics, develop and gather feedback on individualized concentration proposals, and review BIS program requirements.

Notes: Open only to pre-BIS students and BIS majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIS 390 - The Research Process

Credits: 3 (NR)
Focuses on skills to develop a research project, find and organize relevant information, examine and critique evidence, establish criteria, and create plan to complete senior project.

Fulfills writing intensive requirement in the major.

Prerequisite(s): BIS 300 and a grade of 2.00 or above in ENGL 302/ENGH 302.

Notes: Open only to pre-BIS students and BIS majors. Students cannot receive credit for both BIS 390 and 391.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
BIS 391 - The Research Process for Honors

Credits: 3 (NR)
Focuses on skills to develop an honors-level research project, find and organize relevant information, examine and critique evidence, establish criteria, and create plan to complete Honors Senior Research Project (BIS 490). Approved research proposal required prior to registration in BIS 490.

Prerequisite(s): Acceptance to honors in the BIS major.

Notes: Students cannot receive credit for both BIS 390 and 391.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIS 399 - Special Topics

Credits: 1-3 (RT)
Selected topics reflecting interest in specialized areas.

Prerequisite(s): Open only to degree students in BIS.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

BIS 489 - Directed Readings and Research

Credits: 1-3 (RD)
Readings and research on a topic directly relevant to student's core concentration.

Notes: Open only to pre-BIS students and BIS majors. Individualized sections by arrangement. Guided by instructor with expertise. Topics must be approved by instructor and BIS director prior to enrollment.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

BIS 490 - Senior Project

Credits: 3 (NR)
Project or thesis on a topic directly relevant to student's concentration. Guided by student's faculty advisor and 490 instructor.

Fulfills general education requirement in synthesis.

Prerequisite(s): BIS 390
Corequisite(s): BIS 491

Notes: Open only to BIS majors. Individualized sections for BIS honors. Capstone course in BIS core concentration. Research proposals must be approved by faculty mentor, executive committee, and BIS director prior to enrollment.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Undergraduate Special

BIS 491 - Senior Project Presentation

Credits: 1 (NR)
Focuses on preparation and delivery of a formal presentation of student's BIS 490 project. Includes review of basic presentation techniques.

Prerequisite(s): BIS 390.

Corequisite(s): BIS 490.

Notes: Open only to BIS majors.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Undergraduate Special

BIS 495 - Career Practicum

Credits: 1-6 (RD)
Supervised experience in application of specified area.

Prerequisite(s): Permission of instructor and BIS director.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Undergraduate Special

Biodefense (BIOD)

Offered by the College of Humanities and Social Sciences

BIOD 604 - Introduction to Biodefense I: Bacterial and Toxin Agents

Credits: 3 (NR)
Covers pathology, metabolism, and threat of bacterial agents that can be used as biological weapons.
BIOD 605 - Introduction to Biodefense II: Viral Agents

Credits: 3 (NR)
Covers pathology, metabolism, and threat of viral agents that can be used as biological weapons.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 607 - Introduction to Biodefense/Threat Analysis III: Toxins

Credits: 3 (NR)
Discusses the threat of toxins as biological weapons. Special focus on microbiological toxins, including botulinum toxin, and biochemical action of toxins. Comparison to chemical weapons and debate about classification as such.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 609 - Biodefense Strategy and Policy

Credits: 3 (NR)
Introduces students to the biodefense and biosecurity strategies and policies of the United States, other nations, and international organizations. Evaluates the effectiveness of these policies in strengthening defenses, improving intelligence, increasing oversight, enhancing nonproliferation, and reinforcing norms. Examines the interaction of biodefense and biosecurity with homeland, national, and international security.

Prerequisite(s): BIOD 604 and 605 or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0-6

BIOD 610 - Advanced Topics in Biodefense

Credits: 1-4 (RT)
Different topics, depending on instructor's specialty. Topics may include legal, ethical, scientific, and political aspects of biodefense, emphasizing current problems and research.

Prerequisite(s): BIOD 604 and 605 or permission of instructor.

Notes: May be repeated for a maximum of 18 credits when topic is different.
BIOD 620 - Health and Security

Credits: 3 (NR)
Explores issues emerging from the interaction of health and security that represent novel challenges to policy makers confronting a rapidly changing security landscape. Presents the major lines of discourse in the academic literature examining links between health and security. The impact of the AIDS epidemic on national and regional security, the role of health issues in post-Cold War conflict situations, and the security implications of advances in the life sciences.

Prerequisite(s): BIOD 604 and 605 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 621 - Ethics and International Security

Credits: 3 (NR)
Challenges students to wrestle with dilemmas raised by the desire to behave ethically in an international system in which consensus about ethical matters is absent. Students will develop, apply, and justify their own perspective on an ethical problem related to international security using ethical theory and social science research. Ethical issues related to nuclear, biological, and chemical weapons that confront researchers, policy makers, and practitioners will be addressed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 622 - Negotiating in the International Arena

Credits: 3 (NR)
Provides students with the concepts and tools for analyzing complex negotiation processes and introduces them to the challenges facing international negotiators. Students will read about the frameworks and perspectives that have guided the scholarly research on negotiation, as well as the latest findings from that research; analyze complex cases of actual negotiations in the security, trade, and environmental areas; and negotiate key issues on the agendas of nations and international organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 705 - Intelligence: Theory and Practice

Credits: 3 (NR)
Theory and practice of intelligence, including the intelligence cycle, organization of the intelligence community, and the origins and impact of recent reforms. Examines the capabilities and limitations of the different collection disciplines, analytic methodologies and pathologies, and the relationship between intelligence and policy. Analyzes challenges posed by collecting
and analyzing intelligence on weapons of mass destruction programs conducted by states and terrorists.

**Prerequisite(s):** BIOD 604 and 605, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**BIOD 706 - Nuclear, Biological, and Chemical Weapons Policy and Security**

Credits: 3 (NR)  
Explores the causes, conduct, and consequences of the proliferation of nuclear, biological, and chemical weapons. Covers the historical, technological, normative, and strategic factors that have promoted and restrained the spread of these weapons. Addresses the motives for states to develop these weapons and the debate over the security implications of nuclear, biological, and chemical weapon proliferation.

**Prerequisite(s):** BIOD 604 and 605, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**BIOD 709 - Nonproliferation and Arms Control**

Credits: 3 (NR)  
Examines the array of national and international measures used to slow, halt, and reverse the spread of nuclear, biological, chemical, and missile weapons. Explores the theory and practice of proliferation to provide insights into the supply and demand aspects of proliferation.

**Prerequisite(s):** BIOD 604 and 605, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**BIOD 710 - Approaches to Bioweapon Medical Treatment and Response**

Credits: 3 (NR)  
Examines research, treatment, and preparedness strategies against natural and human-made biological agents. Focuses on various strategies, including immunological, pharmaceutical, and medical treatment methodologies and designs.

**Prerequisite(s):** BIOD 604 and 605 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**BIOD 722 - Examining Terrorist Groups**
Credits: 3 (NR)
Introduction to terrorism including the history and evolution of terrorism, case studies of key terrorist groups, the current nature of the terrorist threat and counterterrorism strategies.

Prerequisite(s): BIOD 604 and 605, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 723 - Legal Dimensions of Homeland Security

Credits: 3 (NR)
Introduces the impact of legal issues on homeland security and biodefense. Topics include the origins of the Department of Homeland Security, the relationship between public health and law enforcement, the role of the military in homeland security, trade-offs between privacy and security, legal aspects of public-private cooperation in biodefense and homeland security, quarantine authority and enforcement, ensuring compliance with international treaties, and implementing biosecurity regulations.

Prerequisite(s): BIOD 604 and 605, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 725 - Terrorism and Weapons of Mass Destruction

Credits: 3 (NR)
Examines the capabilities and intentions of terrorists to acquire and use chemical, biological, radiological, and nuclear (CBRN) weapons. The course provides an in-depth understanding of the history of CBRN terrorism, the current challenges posed by this threat, and the range of national and international policy tools available to address this threat.

Prerequisite(s): BIOD 604 and 605, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 726 - Agroterrorism and Food Security

Credits: 3 (NR)
Analyzes the threat of agricultural terrorism, including assessments of the chemical and biological agents used to disrupt agriculture and livestock, and the national and global economic and social impacts of these disruptions. Also examines strategies for enhancing the security of the food production and supply systems.

Prerequisite(s): BIOD 604 and 605, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
BIOD 751 - Biosurveillance

Credits: 3 (NR)
Provides an understanding of the capabilities required to provide reliable early warning of disease outbreaks and identify their etiological agents. Assesses strengths and limitations of physicians, laboratories, epidemiologists, aerosol sensors, and syndromic surveillance systems. Considers challenges posed by the integration and analysis of the information collected by these sources.

Prerequisite(s): BIOD 604 and 605, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 752 - The Role of the Military in Homeland Security

Credits: 3 (NR)
Analyzes the role that the armed forces play in homeland security, including historical and legal developments, the role of the National Guard, capabilities for crisis and consequence management, and case studies of military assistance to civilian authorities in response to riots, terrorist incidents, and natural disasters.

Prerequisite(s): BIOD 604 and 605, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 760 - National Security Technology and Policy

Credits: 3 (NR)
Introduces students to the intersection of science, technology, and policy in national security. Will examine the players in the formation of science policy; the roles they play; how the types, uncertainties, and availability of data affect science policy debates; and how science policy decisions are made. Topics to be covered include weapons of mass destruction, nonlethal weapons, nanotechnology, bioengineering, energy security, and pandemic influenza.

Prerequisite(s): BIOD 604 and 605, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 762 - Into the Hot Zone: Working in a High Threat Environment

Credits: 2 (NR)
Introductory course covers methodology of working in a Biosafety Level 3 or 4 environment. Special attention to responding to biowarfare or bioterrorism related event.

Prerequisite(s): BIOD 604 and 605, or permission of instructor.
BIOD 766 - Development of Vaccines and Therapeutics

Credits: 3 (NR)
Analyzes the process of developing new medical countermeasures against biological weapons and emerging infectious diseases such as SARS and pandemic influenza. Special attention is paid to the scientific, technical, political, regulatory, and economic obstacles to developing new vaccines and therapeutics. Examines the causes and potential solutions of public and private sector failures.

Prerequisite(s): BIOD 604 and 605 or permission of instructor.

BIOD 780 - Master's Supervised Internship

Credits: 1-6 (RD)
Internship under supervision of qualified professional in biodefense at a government agency, consulting firm, industrial firm, or other acceptable agency.

Prerequisite(s): Permission of program director or advisor.

BIOD 793 - Directed Studies in Biodefense

Credits: 1-3 (RD)
Individualized study of topics not otherwise available in graduate program. May involve reading assignments, tutorials, lectures, papers, presentations, or lab or field study, determined in consultation with instructor.

Prerequisite(s): Permission of the instructor and program director.

BIOD 798 - Master's Research Project in Biodefense

Credits: 3 (NR)
Research project related to student's concentration under supervision of faculty advisor. Student produces substantial and original contribution to the field of biodefense on the model of an article in a scholarly journal.
Prerequisite(s): 24 credits in BIOD and permission of project director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: S/NC

BIOD 799 - Master's Thesis in Biodefense

Credits: 1-6 (RD)
Master's thesis research under direction of thesis committee.

Prerequisite(s): 24 credits in BIOD and permission of thesis committee.

Hours of Lecture or Seminar per week: 1-8
Hours of Lab or Studio per week: 0
Grading: S/NC

BIOD 810 - Advanced Seminar in Biodefense

Credits: 3 (RT)
Explores issues of contemporary and emerging concern in biodefense and biosecurity. Topics may include legal, ethical, scientific, economic, and political aspects of biodefense and biosecurity.

Prerequisite(s): BIOD 604 and 605 or permission of adviser.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOD 890 - Doctoral Supervised Internship

Credits: 1-6 (RD)
Internship under supervision of qualified biodefense professional at government agency, consulting firm, industrial firm, or other acceptable agency.

Prerequisite(s): Permission of program director or advisor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

BIOD 899 - Directed Research in Biodefense
Credits: 1-12 (RD)
Research on a pertinent topic in biodefense; scope and subject determined by instructor.

Prerequisite(s): Approval of program director.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

BIOD 996 - Doctoral Reading and Research

Credits: 1-9 (RD)
Independent reading and research on specific biodefense topic under faculty member's direction. Specific arrangements for designing scope and area of study to be determined in consultation with instructor. May involve literature searches and review, workshops, tutorials, or other formats.

Notes: May be repeated for credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

BIOD 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Development of a research proposal, which forms the basis for doctoral dissertation under guidance of dissertation director committee.

Notes: Only 12 credits may be applied to the degree.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NC

BIOD 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral dissertation research under direction of dissertation chair.

Prerequisite(s): Completion of 998 and advancement to candidacy.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NC

Bioengineering (BENG)
Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.

**BENG 101 - Introduction to Bioengineering**

Credits: 3 (NR)
Surveys the field of bioengineering and the global impact of technology innovation in solving problems in biology and medicine with an emphasis on engineering tools and concepts. Introduces mathematical modeling and analysis of bioengineering problems through the use of standard software packages for simulation. Discusses the history, ethical/social implications, and career paths in Bioengineering.

*Hours of Lecture or Seminar per week: 3*
*Hours of Lab or Studio per week: 0*
*When Offered: Spring*

**BENG 220 - Physical Bases of Biomedical Systems**

Credits: 3 (NR)
This course introduces the student to the physical basis of biomedical systems and signals. It demonstrates basic concepts of systems and signals theory, like linearity, superposition, frequency and transfer functions and shows their derivation from the biophysical concepts such as mechanics, fluid mechanics, pharmacokinetics and molecular biophysics which underlie the signals in living systems. The course aims at providing the student with the mathematical and physical understanding to quantitatively describe biological systems.

*Prerequisite(s): Grade of C or better in BENG 101, MATH 213, and PHYS 160. Prerequisite enforced by registration system.*

*Corequisite(s): MATH 214, or permission of instructor.*

*Notes: Students cannot receive credit for both BENG 220 and ECE 220.*

*Hours of Lecture or Seminar per week: 3*
*Hours of Lab or Studio per week: 0*
*When Offered: Fall, Spring*

**BENG 301 - Bioengineering Measurements**

Credits: 3 (NR)
This course introduces the basic concepts and tools for making biomedical measurements, describes instrumentation design and analysis considerations, and discusses several practical applications.

*Prerequisite(s): Grade of C or better in BENG 380 and BENG 320; Grade of C or better in BIOL 425 or BIOL 430 or BENG 313. Prerequisite enforced by registration system.*

*Corequisite(s): BENG 302.*
**BENG 302 - Bioengineering Measurements Lab**

Credits: 1 (NR)

This laboratory course will provide students hands-on experience with sensors and instrumentation relevant to the analysis of living systems and related processes. Biomedical measurements include electrocardiograms, electromyograms, spirometry, pulse oximetry, and glucose monitoring.

Corequisite(s): BENG 301

**BENG 304 - Modeling and Control of Physiological Systems**

Credits: 3 (NR)

This course will introduce students to a systems-level understanding of biomedical systems. Mathematical modeling of dynamic systems will be emphasized, including the role of feedback. Analogies between electrical and mechanical systems will be discussed. Examples covered will include multiple scales ranging from cells to organ systems.

Prerequisite(s): Grade of C or better in BENG 320, MATH 214 and PHYS 260; Grade of C or better in BIOL 425 or BIOL 430 or BENG 313. Prerequisite enforced by registration system.

**BENG 313 - Physiology for Engineers**

Credits: 3 (NR)

This course provides a broad introduction to the subject of human physiology, focusing on learning the subject matter from an engineering viewpoint. Organs and physiological systems where engineering has a significant role are emphasized.

Prerequisite(s): Grade of C or better in BIOL 213 and MATH 113. Prerequisite enforced by registration system.

**BENG 320 - Bioengineering Signals and Systems**
Measurements from living systems are almost always analyzed digitally. This course will introduce students to the conversion of analog signals to digital ones, and how to use digitally processed signals in biomedical applications.

**Prerequisite(s):** Grade of C or better in BENG 101 and MATH 213. Prerequisite enforced by registration system.

**Notes:** Students cannot receive credit for both BENG 320 and ECE 320.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**BENG 380 - Introduction to Circuits and Electronics**

Credits: 3 (NR)  
Builds on simple circuit concepts introduced in PHYS 260. Includes circuit analysis using superposition, equivalent circuits and transient analysis of RL, RC and RLC circuits; sinusoidal excitations, AC steady state analysis; frequency response; operational amplifiers; semiconductor devices such as diodes, field effect and bipolar transistors; and digital logic circuits. (Not intended for those majoring in electrical or computer engineering.)

**Prerequisite(s):** Grade of C or better in PHYS 260 and in MATH 214. Prerequisite enforced by registration system.

**Corequisite(s):** BENG 320.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**BENG 381 - Circuits and Electronics Lab**

Credits: 1 (NR)  
Lab associated with BENG 380. Gives students laboratory experience in basic electronics emphasizing issues and considerations that are paramount for biomedical instrumentation.

**Prerequisite(s):** Grade of C or better in PHYS 261. Prerequisite enforced by registration system.

**Corequisite(s):** BENG 380

**Notes:** Not intended for those majoring in electrical or computer engineering.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 3  
**When Offered:** Fall

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**BENG 395 - Mentored Research in Bioengineering**
Students are matched with faculty mentors who are actively involved in Bioengineering-related research. Introduces the scientific research process through this "hands on" experience. Students are expected to spend no less than 60 hours per semester working with their mentors.

**Prerequisite(s):** At least 60 credit hours applicable to the Bioengineering program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**BENG 425 - Assistive Control of Biomedical Systems**

Credits: 3 (NR)  
An important contribution of bioengineering is the development of assistive devices for individuals with disabilities. This course exposes students to the engineering design process with special focus on medical and biological applications. The semester culminates in the presentation of a group instrumentation project.

**Prerequisite(s):** Grade of C or better in BENG 301 and BENG 320. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**BENG 441 - Nanotechnology in Health**

Credits: 3 (NR)  
This course introduces fundamental principles of a wide range of nanoscale biomaterials and their applications in medicine and engineering.

**Prerequisite(s):** CHEM 251, CHEM 212, BIOL 213, PHYS 160 or Permission of Instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring.

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**BENG 491 - Bioengineering Senior Seminar I**

Credits: 1 (NR)  
This course will familiarize students with the variety of responsibilities of bioengineers to society. Topics will include ethics, regulation, research, industry, entrepreneurship, and cost issues. Professional approaches to job searching and effective technical communication also will be discussed. Speakers will include faculty, invited guests from industry and government, as well as students.

Equivalent to ECE 491

**Prerequisite(s):** Senior standing.
Notes: Students cannot receive credit for BENG 491 and ECE 491.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall

BENG 492 - Senior Advanced Design Project I

Credits: 2 (NR)
Conception of senior design project in bioengineering and determination of feasibility of proposed project. Work includes developing preliminary design and implementation plan.

Prerequisite(s): 90 credit hours applicable to the Bioengineering Program, COMM 100.

Notes: Students cannot receive credit for both BENG 492 and ECE 492.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

BENG 493 - Senior Advanced Design Project II

Credits: 2 (NR)
Project includes designing and constructing hardware, writing required software, conducting experiments or studies, and testing complete system. Requires oral and written reports during project and at completion.

Prerequisite(s): BENG 492, preferably in the preceding semester.

Notes: Implementation of project for which preliminary work was done in BENG 492.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

BENG 495 - Bioengineering Senior Seminar II

Credits: 1 (NR)
This seminar course familiarizes students with a variety of responsibilities of bioengineers. Topics include dealing with biomedical ethics, regulatory requirements, global considerations, and health care costs. Speakers will include faculty, as well as guests from industry, government, and academia. Students are required to explore and then present some material themselves.

Prerequisite(s): 90 credit hours applicable to the Bioengineering Program, COMM 100.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Spring
**BENG 499 - Special Topics in Bioengineering**

Credits: 0-4 (RT)
Topics of special interest to undergraduates.

*Notes:* May be repeated for maximum 6 credits if topics substantially differ.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**BENG 525 - Neural Engineering**

Credits: 3 (NR)
Provides an overview of topics in Neural Engineering. Topics covered range from sensory and motor prosthetic devices, stimulation of biological tissue, bioelectrodes and characterization techniques, brain-machine interfaces, and engineered devices to ameliorate neurodisorders.

*Prerequisite(s):* Graduate Standing or permission of instructor; background in Electrical or Computer Engineering disciplines required.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**BENG 538 - Medical Imaging**

Credits: 3 (NR)
Provides an introduction to the physical, mathematical and engineering foundations of modern medical imaging systems, medical image processing and analysis methods. In addition, this course introduces engineering students to clinical applications of medical imaging. The emphasis is on diagnostic ultrasound and magnetic resonance imaging methods, although several other modalities are covered. The course also provides an overview of recent developments and future trends in the field of medical imaging, discusses some of the challenges and controversies, and involves hands-on experience applying the methods learnt in class to real-world problems.

Equivalent to ECE 538

*Prerequisite(s):* Graduate Standing or permission of instructor; ECE 320 or equivalent; PHYS 262 or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**BENG 590 - Selected Topics in Bioengineering**
This course addresses selected topics from recent developments in various Bioengineering disciplines. Course content may vary each semester depending on instructor and students’ interests.

**Prerequisite(s):** Graduate standing or permission of department.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

### BENG 636 - Advanced Biomedical Signal Processing

Credits: 3 (NR)  
Provides an overview of advanced topics in biomedical signal processing with an emphasis on practical applications. Topics include introduction to physiological origins of biomedical signals, stochastic and adaptive signal processing, spectral estimation, signal modeling and analysis of nonstationary signals.

**Prerequisite(s):** Graduate Standing; ECE 535 or equivalent; ECE 528 or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring.

### BENG 699 - Advanced Topics in Bioengineering

Credits: 3 (RD)  
Advanced topics of current interest in bioengineering. Topics chosen so they do not duplicate other courses in department. Active participation encouraged in form of writing and presenting papers in research areas.

**Prerequisite(s):** Permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

### Bioinformatics (BINF)

Offered by the College of Science

### BINF 334 - Perl for Bioinformatics

Credits: 3 (NR)  
Introduction into Perl programming language. The topics include data representation, control structures, file input/output, subroutines, regular expressions, debugging, relational databases. The course emphasizes bioinformatics applications including DNA sequence analysis, parsing FASTA and GenBank files, processing BLAST output files, SQL or equivalent query language.
Prerequisite(s): Knowledge of programming language or CS 112 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

**BINF 354 - Foundations in Mathematical Biology**

Credits: 3 (NR)
Interdisciplinary introduction to life sciences for physicists, chemists, engineers, and mathematicians. Combines knowledge from natural sciences, social and behavioral sciences, quantitative reasoning, and information technology. Covers selected topics in ecology, physiology, biochemistry, and behavior. May include biochemical reaction kinetics, Hodgkin-Huxley model for cellular electrical activity, continuous and discrete population interactions, and neural network models of learning. Techniques utilized include ordinary differential equations, difference equations, algebraic equations, and computer simulations.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses (must include a chemistry course); MATH 114 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BINF 401 - Bioinformatics and Computational Biology I**

Credits: 3 (NR)

The course covers the following topics and related methodology: protein sequence, structure prediction, and modeling methods; nucleic acid sequence and structure prediction; gene structure prediction in prokaryotes and eukaryotes; elements of system biology. Students will learn programming approaches to solve bioinformatics problems.

Prerequisite(s): BIOL 231, IT 108, IT 208, STAT 344.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BINF 402 - Bioinformatics and Computational Biology II**

Credits: 3 (NR)
The course is a continuation of BINF401 and studies in-depth several algorithms and methods used in bioinformatics and computational biology. Students will learn sequence alignment and assembly algorithms, hidden Markov models, classification and prediction methods, genome annotation. These techniques will then be applied to current bioinformatics problems. Programming assignments are incorporated in the course program.
Prerequisite(s): BINF 401.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BINF 403 - Bioinformatics and Computational Biology Lab I**

Credits: 1 (NR)
Laboratories will introduce students to bioinformatics tools designed to answer research problems in the topics covered in lectures, such as sequence alignment, sequence pattern recognition, structural conformation modeling, phylogenetic analysis methods and image comparisons.

Corequisite(s): BINF 401.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3

**BINF 404 - Bioinformatics and Computational Biology Lab II**

Credits: 1 (NR)
Laboratories will introduce students to research bioinformatics tools relevant to lecture topics such as: the correspondence of measured fragments to parent biomolecules, inference methods for gene and protein networks, predicting system outputs given specified inputs.

Corequisite(s): BINF 402

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 3

**BINF 450 - Bioinformatics for Life Sciences**

Credits: 4 (NR)
Teaches students how to understand the basis of and use of bioinformatics software in database searching, sequence analysis, gene identification, genomics, protein structure and phylogeny.

Prerequisite(s): BIOL 213 and either BIOL 482 or BIOL 483/CHEM 463

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

**BINF 470 - Molecular Biophysics**

Credits: 3 (NR)
The course offers a broad introduction into molecular biophysics. The course demonstrates that the application of methods of
physics provides a unique opportunity to tackle complex biological problems. The course is mainly designed for the students majoring in physics or chemistry, but it is also useful for the biology majors interested in bioinformatics and computational biology.

Equivalent to PHYS 370

Prerequisite(s): PHYS 307 or CHEM 331 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BINF 490 - Independent Senior Research in Bioinformatics and Computational Biology**

Credits: 3 (NR)
This course offers individual research in bioinformatics and computational biology under the guidance of faculty member. Written report upon completion of the course is required.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

**BINF 491 - Senior Thesis in Bioinformatics**

Credits: 1 (NR)
A project is chosen and completed under the guidance of a Bioinformatics Department faculty member.

Prerequisite(s): BINF 401.

Notes: An oral progress report with a poster at the fall semester Bioinformatics Student Research Day is required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3

**BINF 492 - Senior Thesis in Bioinformatics**

Credits: 1 (NR)
A project is chosen and completed under the guidance of a Bioinformatics Department faculty member.

Prerequisite(s): BINF 402.

Notes: A written thesis in standard format is required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3
BINF 630 - Bioinformatics Methods

Credits: 3 (NR)
Introduction to methods and tools for pairwise sequence comparison, multiple sequence alignment, phylogenetic analysis, protein structure prediction and comparison, database similarity searches, and discovery of conserved patterns in protein sequence and structures.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BINF 631 - Molecular Cell Biology for Bioinformatics

Credits: 3 (NR)
Intensive review of biochemistry, molecular biology, and cell biology necessary to begin research in bioinformatics. Topics include protein biochemistry, nucleic acids biochemistry, DNA replication, transcription, and translation, recombinant DNA technology, genomics, molecular structure of genes and chromosomes, and gene expression and control.

Prerequisite(s): Undergraduate background in biochemistry or cell biology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BINF 633 - Molecular Biotechnology

Credits: 3 (NR)
Introduction to the theory and practice of molecular biotechnology, with emphasis on the application of tools in today's society. Includes study of recombinant DNA technology, genomics, and bioinformatics as applied to commercially important products. Lectures reflect more recent advances and applications in the commercial aspects of biology.

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BINF 634 - Bioinformatics Programming

Credits: 3 (NR)
Data representation, control structures, file input/output, subroutines, regular expressions, debugging, introduction to relational databases. Emphasizes bioinformatics applications including DNA sequence analysis, parsing FASTA and GenBank files, processing BLAST output files, SQL, or equivalent query language.

Prerequisite(s): Graduate standing and computer programming experience, or permission of instructor.
BINF 636 - Microarray Methodology and Analysis

Credits: 3 (NR)
Theory and practice of genome analysis including genetics, biochemistry, and tools for analyzing global gene expression, and detection and quantification of genes and gene products.

Prerequisite(s): BINF 633, or permission of instructor.

BINF 637 - Forensic DNA Sciences

Credits: 3 (NR)
Intensive introduction to parameters affecting data QC and analysis, including factors arising from biochemistry, chemistry, genetics, statistics, instrumentation, and software.

Equivalent to FRSC 560

Prerequisite(s): Graduate standing or permission of instructor

BINF 639 - Introduction to Biometrics

Credits: 3 (NR)
Introduction to methods for measuring humans. Topics include face, speaker, fingerprint, and shoeprint recognition; and handwriting analysis. Students develop computer programs to perform many of these tasks.

Prerequisite(s): CSI 603 and 604 or permission of instructor.

BINF 650 - Introduction to Bioinformatics Database Design

Credits: 3 (NR)
Students will acquire skills needed to exploit public biological databases, and establish and maintain personal databases that support their own research; such skills include learning underlying data models and the basics of DBMS and SQL.
**BINF 690 - Numerical Methods for Bioinformatics**

Credits: 3 (NR)
Computational techniques for solving scientific problems focusing on applications in bioinformatics and computational biology. Students develop the ability to convert a quantitative problem into computer programs to solve the problem. Emphasizes efficiency and readability of code.

**Prerequisite(s):** CS 112, MATH 113 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**BINF 701 - Biochemical Systematics (Biochemistry) Core for Doctoral Studies in Biosciences and Bioinformatics**

Credits: 3 (NR)
Introduction to biochemical systems to investigate complex, multicomponent, dynamic functions of cellular systems. Such studies employ myriad conceptual and technical approaches in their application. Articles from current literature are basis of course offering. The application of molecular techniques within biosciences is now universal. The cell: What is its structure and how does it function? This is the underlying question of course.

Equivalent to BIOS 701

**Prerequisite(s):** Admission to PhD program in biosciences or bioinformatics, CHEM 663, or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**BINF 702 - Research Methods**

Credits: 3 (NR)
Trains students in research methodologies for life sciences. Covers the three phases of biological research projects: experimental design, data collection, and data analysis.

Equivalent to BIOS 702

**Prerequisite(s):** Admission to PhD program in bioinformatics or biosciences or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
**BINF 703 - Bioinformatics Lab Rotation**

Credits: 1 (RT)
Short-term introductory research on a specific topic in computational sciences and informatics under direction of faculty member.

**Prerequisite(s):** Permission of Instructor.

**Notes:** May be repeated.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 1  
**Grading:** Graduate Special

**BINF 704 - Colloquium in Bioinformatics**

Credits: 1 (RD)  
Seminar presentations in a variety of areas of bioinformatics and computational biology by COS faculty, staff, advanced PhD students, and professional visitors.

**Prerequisite(s):** Graduate standing.

**Notes:** May be repeated for credit.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**BINF 705 - Research Ethics**

Credits: 1 (NR)  
Examines ethical issues in scientific research, reflecting on purpose and reviewing foundational principles for evaluating ethical issues. Provides skills for survival in scientific research through training in moral reasoning and teaching of responsible conduct. Students learn to apply critical-thinking skills to design, execution, and analysis of experiments and analysis of ethical issues in research, including use of animals and humans, standards in computer community, and research fraud. Guidelines for data ownership, manuscript preparation, and conduct of people in authority may be presented and discussed.

**Prerequisite(s):** Permission of instructor.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**BINF 730 - Biological Sequence and Genome Analysis**

Credits: 3 (NR)  
Fundamental methods for analyzing nucleic acid and protein sequences, including pairwise and multiple alignment, database
search methods, profile searches, and phylogenetic inference. Development of probabilistic tools, including hidden Markov models and optimization algorithms. Survey of current software tools.

Prerequisite(s): A course in molecular biology a course in probability and ability to program in a high-level language or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BINF 731 - Protein Structure Analysis

Credits: 3 (NR)
Computational methods for analyzing, classifying, and predicting three-dimensional protein structures. Covers theoretical approaches, techniques, and computational tools for protein structure analysis.

Prerequisite(s): Permission of instructor, or previous courses in molecular biology, biochemistry, and computer programming.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BINF 732 - Genomics

Credits: 3 (NR)
Surveys computational tools and techniques to study whole genomes, and explores biological basis of genome analysis algorithms. Topics include genome mapping, comparative genomics, and functional genomics.

Equivalent to CSI 732

Prerequisite(s): General biology programming experience CSI 700 or equivalent CSI 731 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BINF 733 - Gene Expression Analysis

Credits: 3 (NR)
Analyzes gene expression data. Topics include cluster analysis and visualization of expression data, inference of genetic regulatory networks, and theoretical models of genetic networks.

Prerequisite(s): Permission of instructor; ability to program in a high-level language and a course in molecular biology: S-Plus or Matlab experience recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**BINF 734 - Advanced Bioinformatics Programming**

Credits: 3 (NR)
Topics include algorithm design, complex data structures, object oriented programming, relational databases, designing modules, and graphics and web programming. Students complete a bioinformatics programming project.

Prerequisite(s): BINF 634, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BINF 739 - Topics in Bioinformatics**

Credits: 3 (RT)
Selected topics in bioinformatics not covered in fixed-content bioinformatics courses.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BINF 740 - Introduction to Biophysics**

Credits: 3 (NR)
Introduces biophysics, focusing on physical and chemical concepts and their relation to rapidly expanding interdisciplinary interfaces among biology, chemistry, and physics. Reveals multiscale nature of biophysics, and includes exploration of macroscopic and microscopic applications.

Equivalent to PHYS 630

Prerequisite(s): Undergraduate courses in general physics, calculus, and biology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BINF 741 - Introduction to Computer Simulations of Biomolecules**

Credits: 3 (NR)
Details computational methods in biomolecular simulations, such as molecular dynamics and Monte Carlo algorithms. Special emphasis given to practical applications. Reviews most recent advances in biomolecular simulations.

Prerequisite(s): Graduate standing and good programming skills BINF 690 and 701 or permission of instructor.
BINF 751 - Biochemical and Cellular Systems Modeling

Credits: 3 (NR)
Mathematical and computational methods for analysis of cellular and subcellular processes. Topics may include ion channels, whole cell models, intracellular signaling, biochemical oscillations, pathway modeling, parameter estimation, and sensitivity analysis.

Prerequisite(s): Calculus and knowledge of a computer programming language; and BINF 690 and 701; or permission of instructor.

Notes: Course in differential equations is recommended.

BINF 760 - Machine Learning for Bioinformatics

Credits: 3 (NR)
Machine learning and data mining methods relevant to application to problems in computational biology. Methods include decision trees, random forests, rule learning methods, support vector machines, neural networks, genetic algorithms, instance-based learning, Bayesian networks, and evaluation metrics for learning systems. Applications include cancer prediction, gene finding, protein function classification, gene regulation network inference, and other recent bioinformatics applications selected from the literature.

Prerequisite(s): BINF 630, BINF 631, and BINF 634 or permission of instructor.

Notes: In addition to lectures from the instructor, students will present papers from the literature and complete a machine learning project.

BINF 796 - Directed Reading and Research

Credits: 1-6 (RD)
Reading and research on specific topic in computational sciences and informatics under direction of faculty member.

Prerequisite(s): Permission of instructor.

Notes: May be repeated
**BINF 798 - Research Project**

Credits: 3 (NR)
Project chosen and completed under guidance of graduate faculty member that results in acceptable technical report.

**Prerequisite(s):** 12 graduate credits and permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

**BINF 799 - Master's Thesis**

Credits: 1-6 (RD)  
Project chosen and completed under guidance of graduate faculty member that results in acceptable technical report (master's thesis) and oral defense.

**Prerequisite(s):** 12 graduate credits and permission of instructor.

**Hours of Lecture or Seminar per week:** 2-3  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/IP

**BINF 820 - Advanced Topics in Molecular Cell Biology**

Credits: 3 (NR)  
Topics may include cell structure, biomembranes and cell architecture, cell signaling, receptor activation, gene expression and control, protein targeting and trafficking, and cell cycle regulation.

**Prerequisite(s):** BINF 631 or equivalent.

**Notes:** Advanced molecular and cellular biology foundation for BINF students.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**BINF 831 - Structural Genomics Project**

Credits: 3 (NR)  
Covers knowledge-based, large-scale protein structure analysis; classification and prediction of protein structure and function; and other current research topics in structural genomics. Projects address entire research enterprise from developing and defending proposal to peer-reviewed publication.

**Prerequisite(s):** BINF 731, or permission of instructor.
BINF 841 - Research Topics in Biomolecular Simulations

Credits: 3 (NR)
Research-oriented course combining lectures and work on individual projects in biomolecular simulations. Topics include protein and peptide aggregation, binding, and unfolding and folding.

Prerequisite(s): BINF 741, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BINF 996 - Doctoral Reading and Research

Credits: 1-6 (RD)
Reading and research on specific topic in computational sciences and informatics under direction of faculty member.

Prerequisite(s): Admission to doctoral program and permission of instructor.

Notes: May be repeated.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

BINF 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Covers development of research proposal, which forms basis for doctoral dissertation, under guidance of dissertation director and doctoral committee.

Prerequisite(s): Permission of advisor.

Notes: May be repeated.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

BINF 999 - Doctoral Dissertation
Credits: 1-12 (RD)
Doctoral dissertation research under direction of dissertation director.

Prerequisite(s): Admission to doctoral candidacy.

Notes: May be repeated, but no more than 24 credits in BINF 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/IP

Biology (BIOL)

Offered by the College of Science

See EVPP, Environmental Science and Public Policy, for additional related course work.

BIOL 103 - Introductory Biology I

Credits: 4 (NR)
Topics include chemistry of life, cell structure and function, Mendelian genetics, evolution, and diversity of life.

Fulfills general education requirement in natural science (lab).

Notes: Survey course suitable for any major. May not be taken after BIOL 200-level or above courses have been taken.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

BIOL 104 - Introductory Biology II

Credits: 4 (NR)
Topics include animal (including human) structure, function, homeostatic mechanisms, organ systems, behavior, higher plant systems, and major concepts in ecology.

Fulfills general education requirement in natural science (lab).

Notes: Students are strongly urged to take BIOL 103 prior to BIOL 104. Survey course suitable for any major. May not be taken after BIOL 200-level or above courses have been taken.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer
**BIOL 105 - Introductory Biology I Laboratory**

Credits: 1 (NR)
The chemical basis of life, the structure and function of the cell, Mendelian and human genetics, and the major animal phyla are presented.

Prerequisite(s): Permission of BIOL 103/104 coordinator and department chair.

Notes: Not available to students who have taken BIOL 103 or the equivalent.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3

**BIOL 106 - Introductory Biology II Laboratory**

Credits: 1 (NR)
The structure and function of major organ systems of animals and an examination of the structure and function of plants, emphasizing the higher plants.

Prerequisite(s): Permission of BIOL 103/104 coordinator and department chair.

Notes: Not available to students who have taken BIOL 104 or the equivalent.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 3

**BIOL 124 - Human Anatomy and Physiology**

Credits: 4 (NR)
Introduction to structure and function of body's major organ systems.

Notes: Should be taken in sequence. Does not satisfy natural science requirement in COS or CHSS. Not available for Biology major credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Summer

**BIOL 125 - Human Anatomy and Physiology**

Credits: 4 (NR)
Introduction to structure and function of body's major organ systems.

Prerequisite(s): BIOL 124.

Notes: Does not satisfy the natural science requirement for the BA in COS or CHSS. Not available for Biology major credit.
**BIOL 213 - Cell Structure and Function**

Credits: 4 (NR)
For science majors and preprofessionals in life sciences. Introduction to cell chemistry, metabolism, and genetics.

Fulfills general education requirement in natural science (lab).

Corequisite(s): CHEM 211

**BIOL 214 - Biostatistics for Biology Majors**

Credits: 4 (NR)
An introduction to statistics used in the life sciences.

Corequisite(s): BIOL 213

**BIOL 246 - Introductory Microbiology**

Credits: 3 (NR)
Introduction to microbial cell structure, physiology, and pathogenicity. Emphasizes control of microorganisms, host-parasite interactions including immunology, and viral and bacterial pathogens.

Prerequisite(s): C or better in BIOL 124 and 125, one year of general biology, or permission of instructor.

Corequisite(s): BIOL 306.

Notes: Not available for biology major credit. Not available to students who have taken BIOL 213 or 418.
BIOL 301 - Biology and Society

Credits: 3 (RT)
Biological problems facing society including pollution, cloning, emerging diseases, global warming, and overpopulation.

Fulfills general education requirement in synthesis.

Prerequisite(s): BIOL 103 and 60 credits, or permission of instructor.

Notes: Not available for biology major or minor elective credit. See Schedule of Classes for current topic; may be repeated if topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 303 - Animal Biology

Credits: 4 (NR)
Emphasizes structure and function of vertebrates, but surveys all animal groups and protozoa. Also covers evolutionary theory, and evolutionary history of major animal groups.

Prerequisite(s): C or better in BIOL 213, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

BIOL 304 - Plant Biology

Credits: 4 (NR)
Introduction to study of plants, their structure, development, nutrition, and ecology. Emphasizes flowering plants, but surveys all groups and their phylogenetic relationships.

Prerequisite(s): C or better in BIOL 213, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

BIOL 305 - Biology of Microorganisms

Credits: 3 (NR)
Morphology, physiology, and pathogenicity of certain groups of bacteria, fungi, and viruses; stresses host-parasite interactions.

Prerequisite(s): C or better in BIOL 213, or permission of instructor. Prerequisite enforced by registration system.
Corequisite(s): BIOL 306.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

BIOL 306 - Biology of Microorganisms Laboratory

Credits: 1 (NR)
Laboratory techniques in culturing, staining, and identifying microorganisms.

Corequisite(s): BIOL 246 or 305.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

BIOL 308 - Foundations of Ecology and Evolution

Credits: 5 (NR)
An examination of the principles of ecology, evolution, and the impact of humans on the world around them. Topics will include evolutionary history, biological diversity, and analyzes of interactions among organisms and between organisms and their environment.

Equivalent to BIOL 307 (2010-2011 Catalog)

Prerequisite(s): BIOL 213, 214 and 311 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring, Summer

BIOL 309 - Introduction to Oceanography

Credits: 3 (NR)
Introduction to chemical, biological, and geological aspects of oceanic environment.

Equivalent to GEOL 309

Prerequisite(s): GEOL 101 or 111 and BIOL 103 or 213 or permission of instructor.

Notes: May include field trip.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
BIOL 310 - Biodiversity

Credits: 5 (NR)
Explores the fundamental principles governing organismal biology while introducing the three domains of life: the Archaea, the Bacteria, the Eukaryotes, plus viruses. Two Saturday or Sunday field trips are required.

Prerequisite(s): BIOL 213, 214 and 311, or permission of instructor.

Notes: BIOL 310 has replaced BIOL 303 and 304. Students who have taken BIOL 310 may not receive credit toward the major for BIOL 303 and/or BIOL 304.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4
When Offered: Fall, Spring, Summer

BIOL 311 - General Genetics

Credits: 4 (NR)
Basic principles of heredity and modern developments in this field.

Prerequisite(s): BIOL 213 with grade of C or better, or permission of instructor. BIOL 214 is recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

BIOL 312 - Biostatistics

Credits: 4 (NR)
Use of probability and descriptive and inferential statistical techniques in interpreting biological data.

Prerequisite(s): BIOL 214 with a grade of C or better, or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2
When Offered: Fall

BIOL 313 - Human Genetics for the Social Sciences

Credits: 3 (NR)
Emphasizes topics of interest to students in social sciences, but open to any non-biology major. Topics include human genome and its inheritance; nature versus nurture; genetic disease; genetics of sex determination, intelligence, personality, and mental illness; genetic differences within and between populations; and evolution of human beings.
Prerequisite(s): One year of biology, or permission of instructor.

Notes: Not available for biology credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring, odd numbered years

BIOL 314 - Introduction to Research Design and Analysis

Credits: 4 (NR)
Introduction to research design in a wide range of biological disciplines. Lecture will concentrate on how to design experiments with proper controls for statistical analysis, as well as obtaining permits and approvals from appropriate agencies. In recitation students will be given data sets to analyze.

Prerequisite(s): BIOL 213, BIOL 214 or 312 or equivalent introductory statistics course, BIOL 311, CHEM 211-212
Completion of Biology core recommended. Must be enrolled in Biology Research Semester. Registration must be approved by a faculty sponsor and by the Biology Program Director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Fall

BIOL 318 - Conservation Biology

Credits: 3 (NR)
Introduction to science used to identify species in need of conservation, and techniques to manage and protect organisms.

Equivalent to EVPP 318

Prerequisite(s): BIOL 308 or BIOL 310, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 320 - Comparative Chordate Anatomy

Credits: 4 (NR)
Compares anatomy and morphology of major chordate groups. Lab emphasizes shark, mudpuppy, cat, and rabbit.

Prerequisite(s): BIOL 308 or BIOL 310 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6
When Offered: Alternate Fall
BIOL 322 - Developmental Biology

Credits: 4 (NR)
Principles of embryonic development and differentiation in animal species at cellular, molecular, tissue, and whole organism levels.

Prerequisite(s): BIOL 213 and BIOL 311, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall

BIOL 326 - Animal Physiology

Credits: 3 (NR)
General consideration of animal function emphasizing common life problems and methods for solving them. Topics include intercellular communication (nervous and endocrine), metabolism, water and solute balance, and cardiovascular and respiratory physiology.

Prerequisite(s): BIOL 213 and BIOL 311, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 327 - Animal Physiology Laboratory

Credits: 2 (NR)
Investigation of invertebrate and vertebrate physiology. Emphasizes responses to environmental changes.

Prerequisite(s): BIOL 326

Corequisite(s): BIOL 326

Notes: Students are required to have concurrent registration in the Recitation.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3

BIOL 331 - Invertebrate Zoology

Credits: 4 (NR)
Survey of invertebrate phyla, excluding insects, showing morphology, phylogeny, and general biology of these groups.

Prerequisite(s): BIOL 308 or BIOL 310, or permission of instructor.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

BIOL 332 - Insect Biology

Credits: 4 (NR)
Survey of insects including taxonomy, morphology, physiology, behavior, ecology, and economic importance.

Prerequisite(s): BIOL 308 or BIOL 310, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

BIOL 334 - Vertebrate Paleontology

Credits: 4 (NR)
Vertebrate Paleontology explores the evolution of vertebrates from the early Paleozoic to Recent. The course will cover the systematics, anatomy, paleogeography, and ecology of extinct vertebrates. Discussions will include fishes, early tetrapods & amniotes, dinosaurs, birds and mammals. Lab portion includes paleontology techniques, analysis, and study of fossil specimens and casts. A weekend field trip is included.

Equivalent to GEOL 334

Prerequisite(s): Any two courses from the following list: GEOL 101, GEOL 102, BIOL 103, BIOL 104, BIOL 213, BIOL 303 or the permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Spring

BIOL 344 - Plant Diversity and Evolution

Credits: 4 (NR)
Investigates the diversity of vascular plants, including angiosperms, their evolutionary relationships, and the bases of their classification and identification.

Prerequisite(s): BIOL 308 or BIOL 310, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Spring

BIOL 345 - Plant Ecology
Investigates the interaction of plants with their abiotic and biotic environment, native Virginian plant communities and their causes, and global processes affecting plant distributions over geological time. 2 Saturday field trips required.

**Prerequisite(s):** BIOL 308 or BIOL 310, or permission of instructor.

**Notes:** Three Saturday or Sunday field trips required.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

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**BIOL 350 - Freshwater Ecosystems**

Credits: 4 (NR)  
Studies physical, chemical, and biological processes in lakes, streams, and wetlands. Lectures, field trips, and lab exercises teach physical and chemical aspects of aquatic systems and life cycles, and adaptations of aquatic organisms.

Equivalent to EVPP 350

**Prerequisite(s):** CHEM 211/212 or CHEM 155/156 and BIOL 308.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

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**BIOL 355 - Ecological Engineering and Ecosystem Restoration**

Credits: 4 (NR)  
Provides definition, classification and practice of ecological engineering and ecosystem restoration. Describes general system ecology, ecosystem restoration, and the utilization of natural processes to provide ecosystem services to society and benefits to nature. Provides students with a systems-oriented perspective on environmental studies. Students will study principles in general system ecology and ecological engineering and explore practices in sustainable ecological design by carrying out a hands-on experimental design project with field microcosms/meocosms in a newly established Wetland Mesocosm Compound on the campus. This course will involve a field trip (1-2 days).

Equivalent to EVPP 355

**Prerequisite(s):** CHEM 211, BIOL 308 and PHYS 243

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

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**BIOL 374 - Biogeography: Space, Time, and Life**

Credits: 3 (NR)  
A survey of the relationship between the distribution of plants and animals on the earth surface and the physical geography and environmental characteristics.
BIOL 377 - Applied Ecology

Credits: 3 (NR)
Introduction to ecosystem concepts and their applications to natural and managed ecosystems.

Equivalent to EVPP 377

Prerequisite(s): 8 credits of biology, geology, or chemistry; 60 credits; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 379 - Ecological Sustainability

Credits: 4 (NR)

Introduces the concepts and applications of several important topics relating to ecological sustainability. Focuses on the role of soils in maintaining and managing environmental quality. Teaches students how to understand and interpret scientific data presented in various types of literature covering ecological sustainability. Designated a Green Leaf Course.

Equivalent to EVPP 378

Prerequisite(s): BIOL 308 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Spring

BIOL 385 - Biotechnology and Genetic Engineering

Credits: 3 (NR)
Emphasizes theory and applications, including significance and societal implications of biotechnology applied to medicine, agriculture, and environment.

Prerequisite(s): BIOL 311; CHEM 211, 212; MATH 110 or 113.
BIOL 402 - Applied and Industrial Microbiology

Credits: 3 (NR)
Biology of microorganisms of ecological and industrial significance. Includes food production, spoilage and preservation, fermentation technology, waste disposal, water purification, biodeterioration, and decomposition.

Prerequisite(s): BIOL 213, 305, 306; CHEM 211, 212; or permission of instructor.

BIOL 403 - Techniques in Applied and Industrial Microbiology

Credits: 1 (NR)
Lab exercises illustrate basic and applied methodologies, including isolation of commercially useful strains. Discusses production and purification of industrial products.

Prerequisite(s): BIOL 213, 305, 306; CHEM 211, 212.

Corequisite(s): BIOL 402, or permission of instructor.

BIOL 404 - Medical Microbiology

Credits: 3 (NR)
Basic principles of infectious diseases caused by bacteria and viruses. Discusses genetics and molecular mechanisms of pathogenicity.

Prerequisite(s): BIOL 305 and 306.

BIOL 405 - Microbial Genetics

Credits: 4 (NR)
Study of structure and function of bacterial DNA, emphasizing mechanisms of gene transfer, expression and regulation. Introduces DNA repair, mutation, and life cycles of bacteriophage.
Prerequisite(s): BIOL 305 and 306.

BIOL 406 - Microbial Physiology and Metabolism

Credits: 4 (NR)
Study of complexity and diversity of microbial physiology and metabolism with emphasis on bacteria. Nutrition, growth, transport, and anabolic and catabolic processes are emphasized. Laboratory includes quantification of cellular macromolecules, enzyme purification and kinetics, column chromatography, and bacterial responses to environmental stimuli.

Prerequisite(s): BIOL 305 and 306.

BIOL 407 - Microbial Diversity

Credits: 4 (NR)
Studies effect of microorganisms on ecological and medical phenomena. Stresses evolution of microbial species, biochemical cycling, and species interactions. Laboratory stresses use of cultural, biochemical, and phylogenetic methods to study microbial isolation, metabolism, and identification.

Prerequisite(s): BIOL 305 and 306.

BIOL 411 - Advanced General Genetics

Credits: 3 (NR)
Topics include quantitative genetics, extrachromosomal inheritance, and special techniques such as mutation screening, developmental genetics, cancer genetics, behavior genetics, evolutionary genetics, and ethics of genetic technology.

Prerequisite(s): C or better in BIOL 311 or permission of instructor.

BIOL 417 - Selected Topics in Molecular and Cellular Biology

Credits: 1-4 (RT)
Study of current topics in molecular and cellular biology. Lecture, laboratory.
Prerequisite(s): BIOL 311 or 482, or permission of instructor.

Notes: Topics vary. May be repeated for credit.

Hours of Lecture or Seminar per week: 0-3
Hours of Lab or Studio per week: 0-6

BIOL 418 - Current Topics in Microbiology

Credits: 3 (RD)
Study of current topics in microbiology.

Prerequisite(s): BIOL 305 and 306.

Notes: Topics vary. May be repeated for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 420 - Vaccines

Credits: 3 (NR)

Prerequisite(s): BIOL 305/306.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 421 - Genetics of Human Diseases

Credits: 3 (NR)
Emphasizes strategies used for identification of genes involved in human genetic diseases. Both monogenic and complex human genetic diseases, as well as principles of genetic screening and counseling, will be presented.

Prerequisite(s): BIOL 311.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 422 - Stem Cell Biology and Regenerative Medicine
A broad overview of the biological principles governing stem cell populations. The functional roles stem cells play in regulating normal development and contributing to disease-state pathologies. An examination of the therapeutic potential of stem cells through "regenerative medicine."

**Prerequisite(s):** BIOL 311.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**BIOL 425 - Human Physiology**

Credits: 3 (NR)  
Organ system approach to study of homeostasis, including cardiovascular, respiratory, renal, digestive, endocrine, and nervous system functions.

**Prerequisite(s):** BIOL 213 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**BIOL 426 - Mechanisms of Aging**

Credits: 3 (NR)  
A course where students will demonstrate knowledge of cellular and molecular mechanisms which drive the systematic changes that result in aging, and to understand the overall biological processes involved in complex biological systems.

**Prerequisite(s):** BIOL 213 and BIOL 311 or equivalent; or Permission of Instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

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**BIOL 430 - Advanced Human Anatomy and Physiology I**

Credits: 4 (NR)  
Organ system approach to studying the structure and function of the human organism and maintenance of homeostasis. Detailed discussion of anatomical structures and their functions of the endocrine, nervous, muscular, skeletal, and integumentary systems following introduction to the cellular and tissue levels of organization. Topics also include selected pathology for each organ system; current therapeutic interventions are addressed.

**Prerequisite(s):** BIOL 213 and 60 credits. Prerequisite enforced by registration system.

**Notes:** Biology 124 is not approved for Biology Majors.

**Hours of Lecture or Seminar per week:** 3
BIOL 431 - Advanced Human Anatomy and Physiology II

Credits: 4 (NR)
Continued study of the structure and function of the human organism and maintenance of homeostasis. Detailed discussion of anatomical structures and their functions of the cardiovascular, lymphatic, respiratory, urinary, digestive and reproductive organ systems. Topics also include selected disorders for each organ system to illustrate disruption of homeostasis.

Prerequisite(s): BIOL 430

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Summer

BIOL 433 - Selected Topics in Plant Biology

Credits: 1-4 (RD)
Lecture or field course in botany. Topic varies with instructor's specialty.

Prerequisite(s): BIOL 310 or permission of instructor.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0-6

BIOL 435 - Selected Topics in Biology

Credits: 1-4 (RD)
Topics vary with instructor's specialty. May be repeated only with permission of Biology Program Director.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0-6
When Offered: Fall, Summer, Spring.

BIOL 440 - Field Biology

Credits: 1-4 (RD)
Directed field studies emphasizing ecology and behavior. Topics vary but include design of field manipulations, data collection and analysis, and introduction to organisms of study site.

Prerequisite(s): BIOL 308 or 310 or permission of instructor.
Notes: Students bear cost of required field trips. May be repeated with permission of Biology Program. Total limit of 4 credits. This course does not satisfy requirements of the BA degree or BS degree, which state that students must complete at least one (BA degree) or two (BS degree) upper division courses that include a laboratory.

Hours of Lecture or Seminar per week: 0-3
Hours of Lab or Studio per week: 3-9
When Offered: Fall, Summer, Spring.

BIOL 446 - Environmental Physiology

Credits: 3 (NR)
Physiological responses of animals to environmental factors and changes in natural environment. Topics include biorhythms and adaptation to temperature, high pressure, and altitude. Emphasis on vertebrates.

Prerequisite(s): BIOL 326 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 449 - Marine Ecology

Credits: 3 (NR)
Plants and animals of marine environments and physical and chemical conditions that affect their existence.

Prerequisite(s): BIOL 308 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 450 - Marine conservation

Credits: 3 (NR)
Provides an overview of threats to the marine environment, and discusses the scientific, socioeconomic, and political issues behind marine conservation. Covers categories of marine pollutants (chemical, biological, and physical contaminants) and their impacts on the marine ecosystem, as well as impacts on humans (health, social, and economic), threats to key marine species (e.g., coral, sharks, turtles, and marine mammals) and initiatives and laws developed to reduce these threats. Scientific and socioeconomic problems that hinder sustainable fisheries management and the science and policy behind the global warming debate are also discussed. The course also provides an overview of marine environmental law and policy issues related to marine conservation policy.

Prerequisite(s): BIOL 309 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring
**BIOL 452 - Immunology**

Credits: 3 (NR)
Topics include structure and function of immunoglobulins, role of cell-mediated immunity, protective role of immune system, and disease and injury related to malfunctions of immune system.

**Prerequisite(s):** BIOL 213, 305, 306, and 311; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

**BIOL 453 - Immunology Laboratory**

Credits: 1 (NR)
Techniques relevant to BIOL 452, including enzyme-linked immunoabsorbant assay, immunodiffusion, protein electrophoresis, and immune fixation.

Fulfills writing intensive requirement in the medical technology major only.

**Prerequisite(s):** BIOL 452

**Corequisite(s):** BIOL 452

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

**BIOL 454 - Marine Mammal Biology and Conservation**

Credits: 3 (NR)
Covers the evolution, biology, ecology, and behavior of marine mammals from polar bears and sea otters to whales and dolphins. Marine mammal conservation and policy is also a major component of the course; several, lecture sessions are devoted to the issue of whaling, threats to marine mammal populations, and recent conservation issues such as marine mammals and noise pollution. The course also includes a number of guest lectures from a variety of international marine mammal experts.

Equivalent to EVPP 419

**Prerequisite(s):** BIOL 309 or BIOL 449 or equivalent; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring
BIOL 455 - Marine Mammal Biology and Conservation Field Course

Credits: 1 (NR)
This course provides laboratory, seminar sessions and field work to accompany BIOL 454-001 - marine mammal biology and conservation. Field work includes several day-long boat trips. The field course may take place in the US or abroad.

Corequisite(s): EVPP 419 or 454.

Notes: At present the two week residential field course takes place in Scotland at the University (of London) Marine Biological Station, which is equipped with boats and laboratories. The course has been running for 11 years, 2 years with GMU as a special topics course.

BIOL 457 - Reproductive Strategies

Credits: 3 (NR)
An introduction to the research and evolutionary theory of sex and reproduction. Course covers topics from the evolution of sex and gender to the evolution of complex reproductive strategies involving behaviors such as mate recognition, courtship displays, territoriality, polygamy, and offspring care. Lectures focus primarily on multi-cellular animals, but also include discussions of unicellular prokaryotes and eukaryotes as well as plants.

Prerequisite(s): BIOL 308 and 60 hours.

BIOL 459 - Fungi and Ecosystems

Credits: 3 (NR)
Considers impact of fungi on ecosystems in terms of biogeochemical cycling, primary and secondary production, and regulating community structure and populations of individual species through their activities as symbionts and parasites. Discusses role of fungi in ameliorating pollutants produced by anthropogenic activities.

Prerequisite(s): BIOL 308 or BIOL 310 or permission of instructor.

BIOL 465 - Histology

Credits: 4 (NR)
Microscopic structure of animal tissues and organs, with emphasis on vertebrates.
Prerequisite(s): BIOL 308 or 310.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

BIOL 468 - Vertebrate Natural History

Credits: 4 (NR)
Introduces vertebrates with emphasis on systematic, evolution, life history, behavior and ecology. Laboratory emphasis on identification, taxonomy, and natural history of local vertebrates.

Equivalent to EVPP 468

Prerequisite(s): BIOL 308 or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Spring

BIOL 470 - Dinosaur Biology

Credits: 3 (NR)
An introduction to the evolution, diversity, and biology of the dinosaurs and their descendants. How current biological knowledge is used to estimate and inter the morphology, physiology and ecology of these extinct animals will be emphasized.

Prerequisite(s): BIOL 308 or BIOL 310 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

BIOL 471 - Evolution

Credits: 3 (NR)
Process of evolution emphasizing role of genetics, properties of populations, and population differentiations.

Prerequisite(s): BIOL 311, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

BIOL 472 - Introductory Animal Behavior
Credits: 3 (NR)
Study of mechanisms, functions, and evolution of behavior.

Prerequisite(s): BIOL 308 or BIOL 310 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 473 - Introductory Laboratory in Animal Behavior**

Credits: 1 (NR)
Field or laboratory study in animal behavior with emphasis on mechanisms, functions, and evolution of behavior. Stresses experimental design and analysis of data. Writing-intensive laboratory.

Prerequisite(s): BIOL 472.

Corequisite(s): BIOL 472.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

**BIOL 482 - Introduction to Molecular Genetics**

Credits: 3 (NR)
Basic concepts of structure and function of genetic material at molecular level.

Prerequisite(s): BIOL 213, 305, and 306, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 483 - General Biochemistry**

Credits: 4 (NR)

Prerequisite(s): BIOL 213; CHEM 313, 314; or permission of instructor.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

**BIOL 484 - Eukaryotic Cell Biology**
Credits: 3 (NR)
Structure and function of cell membranes and organelles with regard to cellular transport, sorting, compartmentalization, signaling, motility, and cell division.

Prerequisite(s): BIOL 311, 483; MATH 110 or 113; or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

BIOL 485 - Eukaryotic Cell Biology Laboratory

Credits: 1 (NR)
Laboratory experiments using cell biology techniques, including microscopy, spectrophotometry, centrifugation, chromatography, and electrophoresis.

Corequisite(s): BIOL 484 or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 3

BIOL 486 - Molecular Biology and Biotechnology Laboratory

Credits: 2 (NR)
Introduction to theory, techniques, and practices used in modern molecular biotechnology laboratories.

Prerequisite(s): BIOL 385 or 482.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 6

BIOL 492 - Senior Seminar

Credits: 1 (RD)
Weekly seminar course dealing with recent advances in biology. Topics selected from recent publications in the field. May be repeated for credit.

Prerequisite(s): BIOL 311 and 90 credit hours, or permission of instructor.

Hours of Lecture or Seminar per week: 1  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring

BIOL 493 - Honors Research in Biology
Laboratory of field investigation under guidance of faculty member.

Prerequisite(s): Admission to the Biology Honors Program, permission of instructor and Biology Program Director.

Notes: Total limit for BIOL 493, 495 and 497 is 8 credits toward the 44 credit hours required for the Biology BS degree and only 4 credits toward the 32 hours required for the BA degree. Combined 493, 495 and 497 may not exceed 4 credit hours in any one semester.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

BIOL 494 - Honors Seminar in Biology

Credits: 1 (RD)
Weekly seminar course dealing with recent advances in biology.

Prerequisite(s): Admission to biology honors program and permission of instructor.

Notes: Topics selected from recent publications in field. May be repeated for credit six times.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

BIOL 495 - Directed Studies in Biology

Credits: 1-3 (RD)
Study of a topic not otherwise available to student. May involve reading assignments, tutorials, lectures, papers, presentations, or field or laboratory study, determined in consultation with instructor.

Prerequisite(s): Permission of instructor and Biology Program Director.

Notes: May be taken for 1 to 3 credits and repeated once for a total of 3 credits. Total limit for combination of 495 and 497 is 6 credits toward 44 credits for BS and 4 credits toward 32 credits for BA. This course does not satisfy requirements of the BA degree or BS degree, which state that students must complete at least one (BA degree) or two (BS degree) upper division courses that include a laboratory.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

BIOL 497 - Special Problems in Biology

Credits: 1-4 (RD)
Lab or field project leading to written report of research. Research and paper completed under instructor's guidance.
Prerequisite(s): 60 credits, and permission of instructor and department chair.

Notes: Total limit for 495 and 497 combined is 6 credits toward the 44 credits required for BS and 4 credits toward 32 credits for BA. This course does not satisfy requirements of the BA degree or BS degree, which state that students must complete at least one (BA degree) or two (BS degree) upper division courses that include a laboratory.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

BIOL 498 - Research Seminar

Credits: 2 (NR)
Seminar discussing current scientific literature and literature related to research project undertaken by student as part of the research semester.

Prerequisite(s): BIOL 213, BIOL 214 or 312 or equivalent introductory statistics course, BIOL 311, CHEM 211-212
Completion of Biology core recommended. Must be enrolled in Biology Research Semester. Registration must be approved by a faculty sponsor and by the Biology Program Director.

Notes: Registration limited to students who are enrolled concurrently in BIOL 499.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall.

BIOL 499 - Research in Biology

Credits: 9 (NR)
Laboratory or field investigation under faculty guidance. Students will earn 9 credits toward the BA or BS degrees in Biology.

Prerequisite(s): BIOL 213, BIOL 214 or 312 or equivalent introductory statistics course, BIOL 311, CHEM 211-212
Completion of Biology core recommended. Must be enrolled in Biology Research Semester. Registration must be approved by a faculty sponsor and by the Biology Program Director.

Notes: Registering for the Research Semester requires successful application and approval by Biology Program and faculty sponsor. Students receiving 9 credits for 499 will not be allowed to use BIOL 440, 495 and/or 497 neither toward the 32 BIOL hours needed for the BA degree, nor toward the 44 BIOL hours needed for the BS degree. This course does not satisfy the laboratory requirement, which states that students must complete at least one (BA degree) or two (BS degree) upper division courses that include a laboratory.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 9
When Offered: Fall.

BIOL 501 - Microbial Diversity: An Organismal Approach
In-depth study of nonpathogenic microbial world, emphasizing detection, enumeration, and classification of microorganisms; their physiological and evolutionary relationships; and biotechnological applications.

Prerequisite(s): Undergraduate course in microbiology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 504 - Va Nat Hist for Teachers**

Credits: 4 (NR)
Prerequisite(s): May be applied to the M.S. in biology in the interpretive track only and then within a 6 hour maximum if combined with BIOL 605. SUMMER.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 1-12

**BIOL 506 - Selected Topics in Microbiology**

Credits: 1-4 (RD)
Topic depends on instructor's specialty.

Prerequisite(s): BIOL 305, 306, or permission of instructor.

Notes: May be repeated only with permission of department chair.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0-6

**BIOL 507 - Selected Topics in Ecology**

Credits: 0-4 (RD)
Topic depends on instructor's specialty.

Prerequisite(s): Course in ecology and permission of instructor.

Notes: May be repeated only with permission of department chair.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0-6

**BIOL 508 - Selected Topics in Animal Biology**
Credits: 1-4 (RD)
Topic depends on instructor's specialty.

Prerequisite(s): BIOL 303, or permission of instructor.

Notes: May be repeated only with permission of department chair.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0-6

BIOL 509 - DNA Analysis of Biological Evidence

Credits: 3 (NR)
Historical development of DNA profiling methods, current DNA typing techniques and the ongoing development of new forensic DNA typing methods. Emphasis will be placed on various analytical techniques used in the analysis of forensic evidence.

Prerequisite(s): BIOL 311 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

BIOL 510 - Forensic DNA Analysis Laboratory

Credits: 1 (NR)
Provides hands on experience with the methodologies of forensic DNA analysis.

Prerequisite(s): BIOL 311

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 1-12
When Offered: Spring

BIOL 515 - Introduction to Neurobiology

Credits: 2 (NR)
Introduction to neurobiology with an overview of embryological development of nervous system in evolutionary context. Regional and systems neuroanatomy is introduced by study of mammalian visual system with a comparative perspective.

Prerequisite(s): Completion of 60 credits, including PSYC 372; or BIOL 213 and 303.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

BIOL 516 - Mammalian Neurobiology
Functional anatomy of mammal brains emphasizing regional and systems neuroanatomy of humans. Correlates with material from clinical neurology, where possible. Laboratory component includes brain dissections and clinical correlations.

**Prerequisite(s):** BIOL 515.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 3

### BIOL 518 - Conservation Biology

Credits: 3 (NR)  
Introduction to science used to identify species in need of conservation, and techniques to manage and protect organisms.

**Prerequisite(s):** BIOL 307, 311, or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### BIOL 520 - Systematics in Complex Angiosperm Families

Credits: 3 (NR)  
Morphology and speciation of more complex families such as Poaceae, Cyperaceae, and Asteraceae. Laboratory emphasizes identification of specimens, and acquaintance with taxonomic literature.

**Prerequisite(s):** BIOL 344 or 534, or permission of instructor.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 6

### BIOL 532 - Animal Behavior

Credits: 3 (NR)  
Ecological aspects of animal behavior.

**Prerequisite(s):** BIOL 324 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### BIOL 533 - Selected Topics in Plant Biology

Credits: 1-4 (RD)  
Topic depends on instructor's specialty.
**Prerequisite(s):** Course in plant biology or permission of instructor.

**Notes:** May be repeated only with permission of department chair.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0-6  
**Grading:** Graduate Special

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**BIOL 534 - Advanced Plant Taxonomy**

Credits: 3 (NR)  
Laboratories consist of field trips, and collection and identification of specimens.

**Prerequisite(s):** Course in plant taxonomy, or permission of instructor.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 6

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**BIOL 535 - Ancient Plants and their Environment**

Credits: 3 (NR)  
Study of factors involved in origin, history, and extinction of fossil plants, including adaptations, paleoecology, and major geological events.

**Prerequisite(s):** BIOL 304, course in paleontology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**BIOL 536 - Ichthyology**

Credits: 4 (NR)  
Studies systematics, evolution, physiology, ecology, and behavior of fishes. Lab time used for field trips, practice in identifying species, and hands-on experience with lecture subjects.

Equivalent to EVPP 536

**Prerequisite(s):** Course in ecology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

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**BIOL 537 - Ornithology**
Credits: 4 (NR)
Study of evolution, systematics, physiology, ecology, and behavior of birds, emphasizing field work.

Prerequisite(s): Course in ecology, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6
When Offered: Alternate Spring

BIOL 538 - Mammology

Credits: 4 (NR)
Study of evolution, systematics, physiology, ecology, and behavior of mammals, emphasizing field work.

Equivalent to EVPP 538

Prerequisite(s): Course in ecology, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6

BIOL 539 - Herpetology

Credits: 4 (NR)
Study of evolution, systematics, physiology, ecology, and behavior of amphibians and reptiles, emphasizing field work.

Prerequisite(s): Course in ecology, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6

BIOL 543 - Tropical Ecosystems

Credits: 4 (NR)
Terrestrial, aquatic, and marine ecosystems in tropics, emphasizing plant communities, plant-animal interactions, and role of humans in the tropics.

Equivalent to EVPP 543

Notes: Field trip to tropics required as part of laboratory.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Spring, even numbered years
BIOL 547 - Terrestrial Plant Ecology

Credits: 4 (NR)
Considers community organization, development, productivity, and mineral cycling; interactions between plants and competitors; herbivores; and environmental factors, especially light, water, and soil. Field work and laboratory emphasize data collection and statistical analysis.

Prerequisite(s): Course in ecology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

BIOL 550 - Wtrscpe Ecology and Mgmt

Credits: 3 (NR)
Field and laboratory approaches to freshwater ecology with emphasis on study design, sampling methods, laboratory and data analysis, and report writing.

Equivalent to EVPP 550

Prerequisite(s): General Chemistry and a course in ecology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 553 - Advanced Topics in Immunology

Credits: 3 (RD)
Comprehensive study of immunologic mechanisms as they pertain to immunologic diseases and transplantation.

Prerequisite(s): BIOL 452, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 554 - Plant Physiology

Credits: 3 (NR)
Prerequisite(s): BIOL 304 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 555 - Lab in Waterscape Ecology


BIOL 556 - Advanced Topics in Microbial Physiology and Metabolism

Credits: 3 (NR)
Comprehensive study of microorganisms including growth, nutrition, transport, autotrophic and heterotrophic metabolism, regulation, and differentiation.

Prerequisite(s): BIOL 305, 306, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 559 - Fungi and Ecosystems

Credits: 3 (NR)
Considers impact of fungi on ecosystems in terms of their effects on biogeochemical cycling, primary and secondary production, and regulating community structure and populations of individual species through their activities as symbionts and parasites. Discusses role of fungi in ameliorating pollutants produced by anthropogenic activities.

Prerequisite(s): BIOL 304 or a course in microbiology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 561 - Comparative Animal Physiology

Credits: 3 (NR)
Detailed study of selected physiological systems of invertebrates and vertebrates, emphasizing current research.

Prerequisite(s): BIOL 326, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 563 - Virology
Credits: 3 (NR)
Fundamental concepts of nature of viruses, virus classification, cultivation, and biochemistry. Emphasizes bacteriophage and animal viruses.

Prerequisite(s): BIOL 482, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

BIOL 564 - Techniques in Virology

Credits: 2 (NR)
Basic techniques of animal virus propagation, isolation, and quantitation.

Prerequisite(s): BIOL 563, or permission of instructor.

Corequisite(s): BIOL 563, or permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3

BIOL 566 - Cancer Genomics

Credits: 3 (NR)
Review of modern concepts in cancer biology including taxonomy of human tumors, common cancer syndromes, and genome instability. Genetic and molecular studies of tumor cell proliferation, migration, invasion, and death.

Prerequisite(s): Course in genetics or biochemistry.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 568 - Advanced Topics in Molecular Genetics

Credits: 3 (RD)
Comprehensive study of regulatory mechanisms controlling gene expression in viruses, prokaryotes, and eukaryotes, emphasizing current research.

Prerequisite(s): BIOL 482, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 572 - Human Genetics
Credits: 3 (NR)
Inheritance of humans emphasizing current problems, including genetic control of metabolic diseases, effects of radiation and chemical agents in environment, and directed genetic change.

Prerequisite(s): BIOL 311, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 573 - Developmental Genetics**

Credits: 3 (NR)
Genetic approaches to problem of eukaryotic development, emphasizing current research on regulation of gene enzyme systems.

Prerequisite(s): BIOL 311, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 574 - Population Genetics**

Credits: 4 (NR)
Genetic structure and dynamics of populations, both real and ideal.

Prerequisite(s): BIOL 308 and 311, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 575 - Selected Topics in Genetics**

Credits: 1-4 (RT)
Different topics in different years, including molecular, developmental, physiological, and classical genetics, emphasizing current problems and research.

Prerequisite(s): BIOL 311, or permission of instructor.

Notes: May be repeated once with permission of department chair.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0-6

**BIOL 576 - Microbial Ecology of Soils**
Credits: 3 (NR)
Detection, identification, and physiological role of microorganisms in soils from root zone to deep subsurface. Emphasizes interactions of microorganisms, viruses through protests, and their functions in soil.

Equivalent to EVPP 576

Prerequisite(s): BIOL 305, 306, or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

BIOL 577 - Biogeochemistry: A Global Perspective

Credits: 3 (NR)
Structure and function of ecosystems, their interactions as components of landscapes, and contributions to global environment. Emphasizes biogeochemical cycles of natural, disturbed, and managed ecosystems, and their integration at landscape and global level as related to current ecological problems such as transfer of nonpoint source pollutants, atmospheric deposition, stratospheric ozone depletion, and global change.

Prerequisite(s): BIOL 308, CHEM 211, 212 or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

BIOL 578 - Mutation, DNA Repair, and Environmental Contamination

Credits: 3 (NR)
Overview of relationship between environmental contamination and genetic damage. Covers types of contamination that result in mutations, and molecular mechanisms of DNA damage and repair.

Prerequisite(s): BIOL 307 and 311.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

BIOL 579 - Molecular Evolution and Conservation Genetics

Credits: 3 (NR)
Evolution of genes and gene families at molecular level, including gene duplication and divergence, positive and negative selection, genetic drift, and molecular clocks. Also includes selected applications in conservation genetics, such as molecular phylogenetics and estimates of population size.

Prerequisite(s): BIOL 311.

Corequisite(s): BIOL 471, or permission of instructor.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 580 - Computer Applications for the Life Sciences**

Credits: 3 (NR)
Studies computer use in biological sciences. Combines lectures, supervised exercises on mainframe and microcomputers. Students present seminar on advanced application, and complete project using computer to fulfill major assignment associated with another course or employment.

Prerequisite(s): 12 credits of biology and one year of college mathematics, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 581 - Estuarine and Coastal Ecology**

Credits: 3 (NR)
Emphasizes marine biology of estuarine and coastal habitats of Chesapeake Bay region, and factors affecting distribution and abundance of organisms.

Equivalent to EVPP 581

Prerequisite(s): Course in Ecology and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 582 - Estuarine and Coastal Ecology Laboratory**

Credits: 1 (NR)
Continues EVPP 546/BIOL 546 as the laboratory section focusing on the approach and methods of estuarine research, including analysis and communication of results.

Equivalent to EVPP 582

Corequisite(s): BIOL/EVPP 581

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 3

**BIOL 583 - General Biochemistry**
Credits: 4 (NR)
Structure and function of proteins, carbohydrates and lipids, enzymology, and metabolism and its controls. Emphasizes chemistry of nitrogen compounds.

Prerequisite(s): BIOL 213; CHEM 313, 314; or permission of instructor.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

BIOL 585 - Eukaryotic Cell Biology Laboratory

Credits: 1-2 (NR)
Selected topics of laboratory procedures used in the study of eukaryotic cells.

Prerequisite(s): BIOL 484 or BIOL 682, or permission of instructor.

Notes: May be repeated one time with permission of program director.

Hours of Lecture or Seminar per week: 0-1
Hours of Lab or Studio per week: 3-6

BIOL 587 - Soil Ecology

Credits: 3 (NR)
Introduction to physical, chemical, and biological processes that govern development of soils and their ecological functions. Emphasizes central role that plants, microbes, and animals play in soil processes. Provides some training in system of soil classification and current methods to study soils.

Prerequisite(s): Course in general ecology or environmental science, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 588 - Global Changes in Climate and Ecology

Credits: 3 (NR)
Focuses on global-level changes that influence ecology. Introduces climate system - past, present, and future - emphasizing links between ecological systems and changes in climate, land use, and element cycling. Topics include responses of forests, oceans to climate change; effects of elevated carbon dioxide on plants; effects of ultraviolet radiation on aquatic systems; salt marsh responses to sea level rise; global eutrophication; desertification; carbon sequestration; and public policy implications of global change science.

Prerequisite(s): Course in ecology, environmental science or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
BIOL 589 - Teaching Practicum

Credits: 1 (NR)
Experience teaching biology in laboratory or in field under supervision of faculty member.

Prerequisite(s): Permission of instructor, chair, and course coordinator (if any).

Notes: Undergraduate assists instructor. May be repeated once.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 3

BIOL 590 - Forensic Entomology

Credits: 3 (NR)
Explores use of insects and arthropods in forensic science as it pertains to investigations of human and animal deaths.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

BIOL 591 - Special Topics

Credits: 1-6 (RD)
Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-21

BIOL 607 - Fundamentals of Ecology

Credits: 3 (NR)
Overview of concepts in physiological, population, community, and ecosystem ecology. Restricted to graduate students with little or no background in ecology.

Equivalent to EVPP 607

Prerequisite(s): Permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
BIOL 608 - Topics in Biology

Credits: 1-4 (RD)
In-service course to strengthen and update teacher's knowledge of biology. Topics include organismal biology, cell biology, ecology, microbiology, or genetics.

Prerequisite(s): Employment or anticipated employment as science teacher.

Notes: Not available for credit toward MS in biology, or PhD in environmental science and public policy. May be repeated for credit with permission of department chair.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0-9

BIOL 610 - Bioremediation: Theory and Applications

Credits: 3 (NR)
Provides basis for understanding proper application of bioremedial technologies to treatment for hazardous wastes. Includes evaluation of data to determine successful treatment.

Equivalent to EVPP 610

Prerequisite(s): Course in microbiology and either organic chemistry or microbial physiology or equivalent or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 611 - Techniques in Environmental Microbiology

Credits: 2 (NR)
Laboratory exercises illustrate techniques to demonstrate microbial degradation, detection of microbes, isolation, and evaluation of physiological and genetic characteristics.

Prerequisite(s): Laboratory course in microbiology, or permission of instructor.

Notes: Open first to those enrolled in BIOL 610.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 4

BIOL 622 - Methods and Principles of Animal Taxonomy

Credits: 3 (NR)
Theoretical basis of techniques in animal classification, emphasizing practical application to laboratory problem dealing with a particular animal group.
Prerequisite(s): Course in evolution, or permission of instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 6

BIOL 640 - Environmental Biology

Credits: 3 (NR)
Patterns of climate and weather, tectonics, soil formation, and surface water and groundwater movements.

Prerequisite(s): Course in ecology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 641 - Envr Sci/Pub Policy

Credits: 3 (NR)
Prerequisite(s): Course in ecology or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 643 - Microbial Ecology

Credits: 4 (NR)
Study of relationships between microorganisms and their natural environment, and methodology for observing their natural environment and biochemical activities in that environment.

Equivalent to EVPP 643

Prerequisite(s): Course in microbiology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

BIOL 644 - Wetland Ecology and Mgmt

Credits: 4 (NR)
Prerequisite(s): CHEM 211, 212, BIOL 307, PHYS 106 and 107, or permission of instructor.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 1-12
BIOL 645 - Freshwater Ecology

Credits: 3 (NR)
Prerequisite(s): EVPP 550 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 648 - Population Ecology

Credits: 3 (NR)
Survey of ecological models and theory. Topics include population growth and regulation; competition; predator-prey, herbivore-plant, and parasite-host interactions; mutualism; and metapopulation ecology.

Equivalent to EVPP 648

Prerequisite(s): Course in ecology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 649 - Biological Resource Management

Credits: 3 (NR)
Applies modern ecological theories and methods to biological resource management in developing and developed countries. Explores problems in achieving optimum productivity of specific resources and application of systems analysis.

Prerequisite(s): Course in ecology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOL 650 - Envrmnt Anly and Modeling

Credits: 4 (NR)
Prerequisite(s): 8 hours of ecology or permission of instructor.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 1-12

BIOL 665 - Environmental Hazards to Human Health
Credits: 3 (NR)
Health effects of chemical contaminants of air, water, and food resulting from industrialized society. Includes identifying, evaluating, and controlling hazards.

Prerequisite(s): Courses in animal physiology and organic chemistry, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 666 - Human Genetics Concepts for Health Care**

Credits: 4 (NR)
Principles of genetically determined diseases with emphasis on clinical aspects of these diseases, genetic counseling, and laboratory methods used in human genetics. Extended studies students preparing to enter medical or dental school are welcome.

Prerequisite(s): BS degree or enrollment in accelerated MS program.

Notes: Course in cell or molecular biology. Not available to students who have taken BIOL 572.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

**BIOL 668 - Advanced Techniques in Molecular Biology**

Credits: 4 (NR)
Experimental studies using current methods for purification and characterization of biologically important compounds. Provides training for research in molecular biology.

Prerequisite(s): BIOL 568, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6

**BIOL 669 - Pathogenic Microbiology**

Credits: 3 (NR)
Molecular mechanisms of bacterial pathogenicity, and immune response in infectious diseases.

Prerequisite(s): Courses in microbiology and biochemistry.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOL 670 - Environmental Law for Biologists**
Study of laws and regulatory issues such as National Environmental Policy Act and Clean Water and Clean Air Acts. Emphasizes critical evaluation of alternatives to unresolved issues in environmental policies.

**Prerequisite(s):** Course in ecology, environmental biology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**BIOL 675 - Aerosol Biology**

Credits: 4 (NR)  
Provides students with familiarity with the state of the art aerosol equipment and techniques used in laboratory-based research pertaining to biological warfare or terrorism threats. Emphasis will be placed on biosafety procedures, techniques, and equipment used in conducting experiments with infectious organisms in a contained environment.

**Prerequisite(s):** Undergraduate courses in physics, math, and microbiology, and permission of the Director of the Center for Biodefense.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

**BIOL 680 - Experimental Design and Analysis for the Life Sciences**

Credits: 4 (NR)  
Advanced course in applying probability and statistics to research in life sciences. Examples drawn from environmental, medical, physiological, genetic, and chemical biology.

**Prerequisite(s):** Course in biostatistics, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

**BIOL 682 - Advanced Eukaryotic Cell Biology**

Credits: 3 (NR)  
Structure and function of biomembranes, cytoskeleton, and transport systems. Also discusses protein trafficking, cell cycle, and cell adhesion molecules.

**Prerequisite(s):** BIOL 483, CHEM 313, 314; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**BIOL 685 - Emerging Infectious Diseases**
Students will gain an understanding of the pathogenesis of emerging and/or re-emerging infectious diseases in terms of immune response and systemic alterations. Factors contributing to emergence and virulence for each pathogen will be emphasized. Epidemiology, disease progression, treatment strategies and/or control measures, of identified emerging infectious diseases will be discussed.

**Prerequisite(s):** BIOL 213 and 311, 482 or equivalent; or Permission of Instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

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**BIOL 690 - Introduction to Graduate Studies in Biology**

Credits: 1-2 (NR)  
Required of all new MS students in biology.

**Hours of Lecture or Seminar per week:** 1-2  
**Hours of Lab or Studio per week:** 0

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**BIOL 691 - Current Topics in Biology**

Credits: 1-4 (RT)  
Study of current topics in biology as determined by the Instructor. Topics center on emerging areas of investigating in the biological sciences. Topics vary. May be repeated for credit.

**Notes:** May be repeated for credit.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 0-6

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**BIOL 692 - Seminar in Biology**

Credits: 1 (RD)  
Topics vary.

**Notes:** May be repeated for credit.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

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**BIOL 693 - Directed Studies in Biology**
Study of topic not otherwise available in graduate program. May involve any combination of reading assignments, tutorials, lectures, papers, presentations, or laboratory or field study, determined in consultation with instructor.

Prerequisite(s): Permission of instructor, chair, and graduate committee.

Notes: May not be used to fulfill explicit undergraduate prerequisites for graduate work.

BIOL 695 - Seminar in Molecular, Microbial, and Cellular Biology

Credits: 1 (RT)
Review and discussion of recent literature in specialized area. Includes student presentations.

Notes: May be repeated for credit.

BIOL 715 - Microbial Physiology

Credits: 3 (NR)
Comprehensive study of functioning of microbial cells, with emphasis on pathogens. Stresses growth, transport, cell-to-cell signaling, biofilm formation, antibiotic resistance, and secondary metabolites.

Prerequisite(s): Undergraduate lecture/lab course in microbiology, and course in biochemistry.

BIOL 718 - Techniques in Microbial Pathogenesis

Credits: 3 (NR)
Laboratory-based class in which students perform current techniques in microbial pathogenesis.

Prerequisite(s): Admission to biosciences PhD or biology MS program, and permission of instructor.

BIOL 720 - Microbial Metabolism
Discussions of catabolic and anabolic pathways of bacterial pathogens, and regulation and integration of these pathways.

**Prerequisite(s):** Undergraduate lecture/lab course in microbiology, and course in biochemistry.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### BIOL 741 - Adv Topic in Environ Bio

Credits: 1-4 (RT)  
**Prerequisite(s):** 8 hours of ecology or permission of instructor.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 1-12

### BIOL 745 - Environmental Toxicology

Credits: 3 (NR)  
Study of nature, distribution, and interaction of toxic chemicals released into the environment. Emphasizes effects on nonhuman biota, detection and fate of chemicals, and implications for government regulation.

Equivalent to EVPP 745

**Prerequisite(s):** Courses in ecology and physiology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### BIOL 793 - Research in Biology

Credits: 1-3 (RD)  
Library, laboratory, or field investigation under supervisor's guidance.

**Prerequisite(s):** 8 graduate credits in BIOL, and permission of instructor and chair.

**Notes:** May be repeated for total 3 credits.

**Hours of Lecture or Seminar per week:** 3-9  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

### BIOL 798 - Master's Research Project
Credits: 1-3 (RD)
Experimental or theoretical research project chosen and completed under guidance of graduate faculty member. Comprehensive report acceptable to student's advisory committee is required.

**Prerequisite(s):** Permission of instructor and department chair.

**Notes:** Students who take BIOL 793 may not receive more than 6 credits total for both BIOL 793 and 798.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

**BIOL 799 - Thesis**

Credits: 1-6 (RD)  
Thesis research under direction of supervisor.

**Prerequisite(s):** 8 graduate hours in BIOL and permission of instructor.

**Notes:** Students who take BIOL 793 may not receive more than 6 credits total for both BIOL 793 and 799.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

**BIOL 800 - Studies for the Doctor of Philosophy in Education**

Credits: 1-6 (RD)  
Program of study designed by student's discipline director and approved by student's doctoral committee. Students participate in research of discipline director, and produce paper reporting original contributions. Paper presented in subsequent PhD Summer seminar.

**Prerequisite(s):** Open only to D.A.Ed. admitted to study in biology.

**Notes:** Enrollment may be repeated.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 1-12  
**Grading:** Graduate Special

**Biomedical Sciences (BMED)**

Offered by the College of Science

**BMED 601 - Cell and Molecular Physiology**
Principles of biochemistry and cell signaling, and current concepts regarding physiological processes at the cellular and molecular levels.

**Prerequisite(s):** Admission to Advanced Biomedical Science certificate program

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

### BMED 602 - Biostatistics and Epidemiology

Credits: 3 (NR)  
Basic principles of biostatistics and epidemiology in theoretical and practical context including: exploring and displaying data appropriately, exploring relationships between two variables, issues of gathering sample data, and understanding randomness and probability.

**Prerequisite(s):** Admission to Advanced Biomedical Science certificate program

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

### BMED 603 - Cell Biology and Microscopic Anatomy

Credits: 3 (NR)  
Examines basic histological techniques, ultrastructure of the cell, basic tissue types and histology of specific organ systems. Structure-functional and clinical correlations are described.

**Prerequisite(s):** Admission to Advanced Biomedical Science certificate program

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

### BMED 604 - Fundamentals of Human Physiology

Credits: 5 (NR)  
Essential concepts of physiology and mechanisms of body function are presented at various levels of organization, ranging from cellular and molecular to tissue and organ system levels. Emphasis is placed on understanding the integrated regulation of various body processes among the major systems.

**Prerequisite(s):** Admission to Advanced Biomedical Science certificate program

**Hours of Lecture or Seminar per week:** 5  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring
BMED 605 - Introduction to Human Anatomy

Credits: 3 (NR)
Principles of anatomy as well as the pertinent anatomy associated with the thorax, abdomen, and pelvic cavities.

Prerequisite(s): Admission to Advanced Biomedical Science certificate program

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

BMED 610 - Principles of Systems Biology

Credits: 2 (NR)
Students will build on their knowledge of cellular and molecular biology, genetics, and physiology to understand how these components combine to give rise to complex systems function found in biology.

Prerequisite(s): Admission to Biomedical Sciences MS program

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1-3
When Offered: Fall

BMED 611 - Molecular Genetics

Credits: 2 (NR)
Students will build on their knowledge of molecular biology and genetics to understand how these components functions are altered during the inception and course of human disease.

Prerequisite(s): Admission to Biomedical Sciences master’s degree

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0
When Offered: Fall

BMED 612 - Principles of Gross Anatomy

Credits: 1 (NR)
Principles of anatomy as well as the pertinent anatomy associated with the thorax, abdomen, and pelvic cavities.

Prerequisite(s): Admission to Biomedical Science’s master’s program

Hours of Lecture or Seminar per week: 1-6
BMED 613 - Pathophysiology

Credits: 3 (NR)
Students build on knowledge of physiologic principles and apply the information to pathologic conditions. A higher understanding of the molecular and genetic basis of pathology will be developed as the mechanisms of disease are studied.

Prerequisite(s): Admission to Biomedical Sciences master’s program

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

BMED 614 - Introduction to Neuroscience

Credits: 3 (NR)
Achieve specific knowledge of the developmental and evolutionary aspects of the nervous system, to introduce systems neurobiology through study of the visual system and motor system pathways.

Prerequisite(s): Admission to Biomedical Science’s master’s program

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

BMED 651 - Physician and Society

Credits: 1 (RD)
Seminar series explores the cultural, social, economic and ethical factors that affect the practice of medicine in the 21st century.

Prerequisite(s): Admission to Advanced Biomedical Science certificate program

Notes: May be repeated for a maximum of two credits

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Spring

BMED 652 - Biomedical Career Pathways
Series of workshops, presentations and field trips. Students will learn study and interview skills, be better prepared to complete AMCAS and secondary applications to medical schools.

Prerequisite(s): Admission to Advanced Biomedical Studies certificate program.

BMED 653 - Forum and Research

Credits: 3 (NR)
Bi-weekly seminar-style presentations and reading assignments, followed by short student reports, followed by a small group discussions on topics of current interest. Students will prepare a detailed research paper on a topic related to one of the forum topics.

Prerequisite(s): Admission to Biomedical Sciences master’s program

BMED 660 - Molecular and Cellular Physiology

Credits: 3 (NR)
Biochemistry and physiology of the typical cell. The biochemical focus will be on the fundamentals of the forces affecting molecular interactions, the structure-function relationships of proteins and carbohydrates, kinetics and catalysis, and high-throughput analysis of proteins in clinical samples. The physiological focus will be on the structure and function of subcellular organelles, and the foundations of some specialized cells – blood and lymphoid cells, muscle cells, and nerve cells.

Prerequisite(s): Admission to Biomedical Sciences master’s program

BMED 661 - Metabolism, Nutrition and Endocrinology

Credits: 4 (NR)
Students will learn the pathways involved in energy metabolism, biosynthesis, and catabolism of waste products in preparation for excretion. Major emphasis will be on the coordination of metabolic pathways in the major organs and tissues through hormonal regulation.

Prerequisite(s): Admission to Biomedical Sciences master’s program
BMED 662 - Cardiopulmonary Biology

Credits: 1-5 (RD)
Anatomy, hemodynamic function, and electrophysiology of the cardiovascular and respiratory system.

Prerequisite(s): Admission to the Biomedical Sciences master’s program.

BMED 663 - Gastrointestinal Biology

Credits: 2 (NR)
Embryologic development, gross and micro-anatomy, and physiologic function of the GI tract. Emphasis will be placed on understanding the integrated regulation of GI processes.

Prerequisite(s): Admission to Biomedical Sciences master’s program

BMED 664 - Renal Biology

Credits: 2 (NR)
Structural, functional and integrative aspects of the kidney and urinary system; identify the basic physiologic mechanisms that underpin renal function; and explain the role the kidney plays in fluid and electrolyte homeostasis, including acid-base balance.

Prerequisite(s): Admission to Biomedical Sciences master’s program

BMED 665 - Sexual Development and Reproduction

Credits: 3 (NR)
Cellular and anatomical components of reproduction and early development. These components include the development of the reproductive track, development of gametes, fertilization, and formation of the germ layers and endocrinology of the system.
Prerequisite(s): Admission to the Biomedical Sciences master's program

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

Biosciences (BIOS)

Offered by the College of Science

BIOS 701 - Biochemical Systematics

Credits: 3 (NR)
Introduces biochemical systems to investigate complex, multicomponent, dynamic functions of cellular systems. Readings include articles from current literature in molecular biosciences. Application of molecular techniques within biosciences is now universal, and underlying questions is, "What is the structure of a cell, and how does it function?"

Equivalent to BINF 701

Prerequisite(s): General biochemistry.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOS 702 - Research Methods

Credits: 3 (NR)
Trains students in research methodologies, techniques, and data analysis in life sciences. Divided into three modules that introduce separate but equally significant components of any research project: parameters required to outline and synthesize a problem, techniques of measurement and analysis used by life scientists, and approaches for data analysis and interpretations.

Prerequisite(s): Admission to PhD program in biosciences.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOS 703 - Laboratory Rotation

Credits: 3 (RT)
Intensive introduction to research laboratory in biosciences. Students read background material pertinent to problem under study, learn and practice research methods of laboratory, and formulate short final project that may be proposal or actual project, demonstrating some mastery of techniques and approaches employed.

Prerequisite(s): Admission to PhD program in biosciences.
BIOS 704 - Topics in Biosciences

Credits: 1 (RT)
Combines invited seminars from internal and external faculty with graduate student seminars. Seminar presentation required for advancement to candidacy, generally given in last semester before candidacy. Includes discussion section led by course coordinator.

Prerequisite(s): Admission to PhD program in biosciences.

Notes: Should be repeated three times (except by permission of concentration director).

BIOS 710 - Current Topics in Bioscience

Credits: 1-3 (RT)
Studies current topic in biosciences.

Prerequisite(s): Admission to biosciences PhD or biology MS program.

Notes: Topics vary. May be repeated for credit with permission of concentration director.

BIOS 719 - Extremophiles

Credits: 5 (NR)

BIOS 740 - Laboratory Methods in Functional Genomics and Biotechnology

Credits: 3 (NR)
Current laboratory techniques in molecular biology and genomics, including nucleic acid isolation, gene cloning and sequencing,
gel blot analysis, PCR, in vitro mutagenesis, and theory and practice of DNA microarray analysis of gene expression. Topics may vary from year to year depending on advances in field.

**Prerequisite(s):** Graduate standing and undergraduate courses in genetics and molecular biology.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 3

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**BIOS 741 - Genomics**

Credits: 3 (NR)  
Genetic structure and function at whole genome level. Includes some sequence analysis, comparative genomics, classical genetics, and developmental genetics, as well as analysis of synteny groups, isochores, gene families, genetic complexity, C value paradox, directed discovery of gene functions, and animal models of human disease. Readings from recent texts and primary research literature. Students expected to give one or two oral presentations of primary research papers, as well as complete midterm and final exams.

**Prerequisite(s):** At least one undergraduate course in genetics and molecular biology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**BIOS 742 - Biotechnology**

Credits: 3 (NR)  
Theory and applications of biotechnology. Includes promoter design, gene fusions, protein targeting, techniques of protein purification, construction of transgenic organisms, cloning of animals and plants, ethical and legal issues. This is a relatively new area of study that is rapidly changing; course strives to keep students abreast of current literature.

**Prerequisite(s):** Undergraduate course work in genetics and molecular biology.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**BIOS 743 - Genomics, Proteomics, and Bioinformatics**

Credits: 3 (NR)  
Fundamental methods for analyzing genomic and proteomic data, including nucleic acid and protein sequences, pair-wise and multiple alignment, database search methods, clustering and presentation of data, prediction modeling, and survey of available software and freeware tools.

**Prerequisite(s):** Admission to biosciences PhD or biology MS program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
BIOS 744 - Molecular Genetics

Credits: 3 (NR)
Develops understanding of principles of modern molecular genetics and methods of investigation of genomes of pro- and eukaryotes, including types of genetic manipulations conducted in research laboratories today.

Prerequisite(s): Undergraduate course work including BIOL 311; CHEM 313, 314, 315, and 318; equivalents; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOS 760 - Seminar in Molecular Systematics

Credits: 1-3 (RD)
Presentations and discussion by students and faculty of research papers and projects.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

BIOS 761 - Dispersal Patterns of Biological Agents

Credits: 3 (NR)
Introduces military and terrorist methods of dispersal patterns. Covers physics of aerosols, engineering and mechanics of building ventilation systems, and mechanical dissemination including handheld, automatic, vehicle, and truck-mounted systems. Also covers viability of specific agents involved.

Prerequisite(s): Admission to biosciences PhD or biology MS program, and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

BIOS 762 - Phylogenetic Analysis

Credits: 4 (NR)
A consideration of molecular systematics techniques in biology, especially cladistics and phenetics methods. Species concepts, biological nomenclature, and classifications will also be discussed. Laboratory will emphasize phylogenetic methods using online sources of comparative data.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

BIOS 765 - Molecular Systematics
Credits: 4 (NR)
Comparative evolutionary techniques applied to molecular data. Use of molecular techniques, molecular databases, and analytical techniques will be covered.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOS 767 - Molecular Evolution**

Credits: 3 (NR)
A review of the diversity and organization of genomes and evolutionary processes that operate at the molecular level. Emphasis will be placed on processes of molecular evolution and techniques used to analyze these processes.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOS 782 - Interdisc Iss: Law/Polc**

Credits: 3 (NR)
Prerequisite(s): BIOS 780 and 781.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**BIOS 898 - Directed Studies in Biosciences**

Credits: 1-12 (RD)
Studies of specialized topics in biosciences. Specific arrangements for designing scope and area of study to be determined in consultation with instructor. May involve literature searches and review, workshops, or tutorials.

Prerequisite(s): Permission of research advisor.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0
Grading: Graduate Special

**BIOS 899 - Directed Research in Biosciences**

Credits: 1-12 (RD)
Research on a pertinent topic in biosciences. Scope and subject of research to be determined by instructor.

Prerequisite(s): Permission of research advisor.

Hours of Lecture or Seminar per week: 1-3
BIOS 998 - Doctoral Dissertation Proposal

Credits: 1-6 (RD)
Research and writing of research proposal for doctoral dissertation.

Prerequisite(s): Permission of research advisor.

BIOS 999 - Doctoral Dissertation Research

Credits: 1-12 (RD)
Research in concentration pertinent to students' program of study.

Prerequisite(s): Admission to candidacy or approval by research advisor.

Notes: Maximum of 24 credits can be applied toward degree.

Business Legal Studies (BULE)

Offered by the School of Management

If a student takes noncore, upper-level business courses before admission to SOM, those courses will not count on an undergraduate degree application for any major in the school, except as general elective credit. A grade of C or higher must be presented on the graduation application for each upper-level course in the major. Course prerequisites are strictly enforced. Degree status is defined as formal admission to BS degree status in SOM.

BULE 302 - Legal Environment of Business

Credits: 3 (NR)

Survey of the legal environment of business, emphasizing legal concepts and legal reasoning to prepare students to recognize legal problems and formulate appropriate responses. Topics include the federal and state court systems, constitutional and administrative law, business torts and crimes, contracts and business ethics. Lecture, discussion, cases.
School of Management students will not be permitted to make more than three attempts to achieve a C or higher in BULE 302. Those who do not successfully complete this course within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

**Prerequisite(s):** Sophomore standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

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**BULE 402 - Commercial Law**

Credits: 3 (NR)  
Survey of commercial law emphasizing the Uniform Commercial Code. Lecture, discussion, cases.

**Prerequisite(s):** C or higher in BULE 302, degree status. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**Business, Minor in (MSOM)**

Offered by the School of Management  
Prerequisite for all MSOM courses is completion of 30 credits (sophomore standing). For the Business Minor, a grade of C or higher is required in each MSOM course used for the minor.

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**MSOM 300 - Managing Financial Resources**

Credits: 3 (NR)  
Focuses on using basic concepts of accounting and financial management to make investment, credit, and operating decisions for an organization. Emphasizes financial reports to aid planning and control of organizational activities.

**Prerequisite(s):** Completion of 30 credits (sophomore standing)

**Notes:** May not be taken for credit by SOM majors. Students who have received credit for both ACCT 203 and FNAN 301 cannot also receive credit for MSOM 300.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

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**MSOM 301 - Managing People and Organizations**
Credits: 3 (NR)
Introduces key issues in management, organizational behavior, and human resource management. Special attention to best practices used by effective managers.

Prerequisite(s): Completion of 30 credits (sophomore standing)

Notes: May not be taken for credit by SOM majors. Students cannot receive credit for both MGMT 301 and MSOM 301.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSOM 302 - Managing Information in a Global Environment

Credits: 3 (NR)
Provides overview of strategic role of information, need for information systems, organizing information, integration of information systems in management processes and decision making, and related discussions in electronic commerce.

Prerequisite(s): Completion of 30 credits (sophomore standing)

Notes: May not be taken for credit by SOM majors. Students cannot receive credit for both MIS 301 and MSOM 302.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSOM 303 - Marketing in a Global Economy

Credits: 3 (NR)
Prepresents marketing principles, concepts, strategies, and analytical tools used by profit and nonprofit organizations to market ideas, products, and services to selected target groups. Emphasizes how to develop, promote, distribute, and price firm's offerings in dynamic economic, social, political, and global environment.

Prerequisite(s): Completion of 30 credits (sophomore standing)

Notes: May not be taken for credit by SOM majors. Students cannot receive credit for both MKTG 301 and MSOM 303.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSOM 304 - Entrepreneurship: Starting and Managing a New Enterprise

Credits: 3 (NR)
Explores behaviors required to successfully launch a new business, tools to identify and evaluate opportunities, and the issues critical to a new firm. Issues include organizational structure, effective marketing strategy, operational logistics, legal issues, financial projections, financing options, and available support structures.
Prerequisite(s): Completion of 30 credits (sophomore standing)

Notes: May not be taken for credit by SOM majors

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MSOM 305 - Managing in a Global Economy

Credits: 3 (NR)
Multidisciplinary approach to global economy from the viewpoint of managing international business. Introduces various aspects of managing business in a global economy including theories and practices of international trade, investment, and business strategies.

Fulfills general education requirement in global understanding.

Prerequisite(s): Completion of 30 credits (sophomore standing)

Notes: May be taken for credit by SOM majors only if taken to satisfy the global understanding requirement for general education.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSOM 306 - Managing Projects and Operations

Credits: 3 (NR)
Introduces project management and operations management concepts and tools including project planning, scheduling, monitoring, and control; process design, selection and improvement; supply chain management; inventory management; and quality assurance.

Prerequisite(s): Completion of 30 credits (sophomore standing)

Notes: May not be taken for credit by SOM majors. Students cannot receive credit for both OM 301 and MSOM 306.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MSOM 491 - Special Topics: Business Minor

Credits: 3 (RD)
Topics related to a minor in business will vary on the focus of the course and by discipline.
Prerequisite(s): Sophomore standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

Character Education (EDCE)

Offered by the College of Education and Human Development

EDCE 601 - How Students Learn Values and Ethics

Credits: 3 (NR)
Applies theories to practice to increase learning through the study of moral and ethical development theories and how students learn personal, prosocial, and civic values.

Prerequisite(s): Admission to Character Education Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCE 602 - Comprehensive Character Education Frameworks

Credits: 3 (NR)
Analyzes comprehensive character education frameworks that have emerged from research and practice, examining framework components and their applications to character education initiatives.

Prerequisite(s): Admission to Character Education Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCE 603 - Global and Ethical Perspectives on Teaching Diverse Learners

Credits: 3 (NR)
Analyzes ethical and moral dimensions of classroom interactions using developmental framework and foundation of democratic principles. Evaluates school politics and policies, and provides overview of prevailing ethical points of view.

Prerequisite(s): Admission to Character Education Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDCE 604 - Character Education Curriculum and Programs

Credits: 3 (NR)
Analyzes and evaluates quality of programs and curriculum materials for character education using program, implementation, and curriculum standards.

Prerequisite(s): Admission to Character Education Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCE 605 - Character Education Assessment and Evaluation

Credits: 3 (NR)
Applies assessment standards and audit tools to analyze and evaluate formative and summative assessments of programs for character education. Utilizes backward design model.

Prerequisite(s): EDCE 602, 603, and 604.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCE 606 - Leadership in Character Education: An Internship in Program Development, Curriculum, Instruction, or Assessment

Credits: 3 (NR)
A 150-hour, on-site internship focusing on one of the following: instructional strategies, curriculum or program development, using resources, or assessment.

Prerequisite(s): EDCE 602, 603, 604, and 605.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCE 607 - Educational Research for Character Educators

Credits: 3 (NR)
Studies and applies fundamental concepts and methods of educational action research. Emphasis on researching how students learn personal, prosocial, and civic values, and teacher and school effectiveness in this area.

Prerequisite(s): EDCE 600, 601, 602, 603, 604, and 605

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Chemistry (CHEM)

Offered by the College of Science

CHEM 211, 212 are prerequisites to all other undergraduate CHEM courses numbered 301 or above.

CHEM 101 - Introduction to Modern Chemistry

Credits: 3 (NR)
Physical and chemical discoveries and properties of matter presented along with their application and impact on way of life. Topics include atomic and molecular structure, nuclear chemistry, and chemistry in Earth and atmosphere.

Fulfills general education requirement in natural science (nonlab).

Notes: Not open to students majoring in chemistry. Credit will not be given for CHEM 101 and CHEM 103, or for both CHEM 101 and CHEM 211 or 212. No previous knowledge of chemistry required.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CHEM 102 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry

Credits: 3 (NR)

Modern and historical accounts of organic chemistry, biochemistry, pharmacology, and fuel chemistry. Topics include the chemistry of carbon compounds, synthesis of polymers and their utility and use in the modern world, biomolecules, DNA and animal cloning, embryonic stem cells, the chemical structure and biological activity of drugs and medicines, and fuel chemistry including petroleum through green chemistry and the future.

Fulfills general education requirement in natural science (nonlab).

Prerequisite(s): Not open to students majoring in chemistry.

Notes: Does not fulfill the requirement for a laboratory course in Chemistry. Not for Chemistry majors. No credit for both CHEM 102 and CHEM 104, or CHEM 212.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CHEM 103 - Chemical Science in a Modern Society

Credits: 4 (NR)

Terminal course in chemistry for nonscience and nursing majors. Principles and application of chemistry.
Fulfills general education requirement in natural science (lab).

Notes: Not open to students majoring in chemistry. Credit will not be given for both this course and CHEM 211, 212. Topics are those described for CHEM 101 and 102 but with lab to enhance scientific experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

CHEM 104 - Introduction to Organic, Biochemical, Pharmacological, and Fuel Chemistry

Credits: 4 (NR)

Modern and historical accounts of organic chemistry, biochemistry, pharmacology, and fuel chemistry. Topics include the chemistry of carbon compounds, synthesis of polymers and their utility and use in the modern world, biomolecules, DNA and animal cloning, embryonic stem cells, the chemical structure and biological activity of drugs and medicines, and fuel chemistry including petroleum through green chemistry and the future. (CHEM 104 requires concomitant registration in a 104 laboratory section.)

Fulfills general education requirement in natural science (lab).

Prerequisite(s): Not open to students majoring in chemistry.

Notes: Not open to students majoring in chemistry. Credit will not be given for both CHEM 104 and CHEM 212

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

CHEM 105 - Introductory Chemistry Laboratory I

Credits: 1 (NR)
Introductory laboratory course to demonstrate principles and application of chemistry.

Prerequisite(s): CHEM 101

Notes: Not open to students majoring in chemistry. Credit will not be given for both this course and CHEM 211, 212.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Fall

CHEM 106 - Introductory Chemistry Laboratory II

Credits: 1 (NR)
1-credit laboratory course for non-science majors. Laboratory experience to demonstrate principles and application of chemistry.
Prerequisite(s): CHEM 102.

Notes: Not open to students majoring in chemistry. Credit will not be given for both this course and CHEM 211, 212.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Spring

CHEM 155 - Introduction to Environmental Chemistry I

Credits: 4 (NR)

Basic chemical principles of Earth's water, air, and soil systems, presented in the context of understanding environmental issues. Includes Saturday morning field trips to sites of past and present environmental contamination, alternating with Saturday morning laboratory activities.
Designated a Green Leaf Course.

Fulfills general education requirement in natural science (lab).

Notes: Credit will not be given for this course and CHEM 103, 104.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

CHEM 156 - Introduction to Environmental Chemistry II

Credits: 4 (NR)

Basic chemical principles of Earth's water, air, and soil systems, presented in the context of understanding environmental issues. Includes Saturday morning field trips to sites of past and present environmental contamination, alternating with Saturday morning laboratory activities.
Designated a Green Leaf Course.

Fulfills general education requirement in natural science (lab).

Prerequisite(s): CHEM 155.

Notes: Credit will not be given for this course and CHEM 103, 104.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

CHEM 201 - Introductory Chemistry I
Credits: 3 (NR)
Fundamental principles of atomic and molecular structure; chemical bonding; basic concepts of chemical reactions and thermochemistry; and properties of gases, liquids, and solids.

Fulfills general education requirement in natural science (nonlab).

Notes: Does not fulfill degree requirements for laboratory science course. Credit will not be given for this course and CHEM 211 or 103. General chemistry course for students interested in science, engineering, mathematics, or computer science who do not require a lab.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CHEM 202 - Introductory Chemistry II

Credits: 3 (NR)
Fundamentals of reaction rates and equilibrium. Topics include kinetics, properties of solutions, ionic equilibrium, chemical thermodynamics, electrochemistry, and nuclear chemistry.

Fulfills general education requirement in natural science (nonlab).

Prerequisite(s): CHEM 201 or 211.

Notes: Does not fulfill degree requirements for laboratory science course. Credit will not be given for this course and CHEM 212 or 104. Second-semester general chemistry course for those interested in science, engineering, mathematics, or computer science who do not require a lab.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CHEM 203 - General Chemistry Laboratory I

Credits: 1 (NR)
General Chemistry laboratory course for students majoring in science, engineering, or mathematics. Laboratory experience to demonstrate general chemistry principles and applications.

Prerequisite(s): CHEM 201.

Notes: Credit will not be given for this course and CHEM 101 or 102 to students majoring in science, engineering, or mathematics.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Spring

CHEM 204 - General Chemistry Laboratory II
Second semester general chemistry laboratory course for students majoring in science, engineering, or mathematics. Laboratory experience to demonstrate general chemistry principles and applications.

Prerequisite(s): CHEM 202.

Notes: Credit will not be given for this course and CHEM 101 or 102 to students majoring in science, engineering, or mathematics.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

CHEM 211 - General Chemistry

Credits: 4 (NR)
Basic facts and principles of chemistry, including atomic and molecular structure, gas laws, kinetics, equilibrium, electrochemistry, nuclear chemistry, and properties and uses of the more important elements and their compounds.

Fulfills general education requirement in natural science (lab).

Notes: Credit will not be given for this course and CHEM 103, 104. Students majoring in science, engineering, or mathematics should choose this course sequence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

CHEM 212 - General Chemistry

Credits: 4 (NR)
Basic facts and principles of chemistry, including atomic and molecular structure, gas laws, kinetics, equilibrium, electrochemistry, nuclear chemistry, and properties and uses of the more important elements and their compounds.

Fulfills general education requirement in natural science (lab).

Prerequisite(s): CHEM 211. Prerequisite enforced by registration system.

Notes: Credit will not be given for this course and CHEM 103, 104. Students majoring in science, engineering, or mathematics should choose this course sequence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

CHEM 251 - General Chemistry for Engineers

Credits: 4 (NR)
Fundamental principles of chemical structure and reactivity including atomic and molecular structure; chemical bonding;
structures of ionic, covalent, and metallic lattices; oxidation reduction; electrochemistry and chemistry of metals; and introduction to organic chemistry and polymers.

Fulfills general education requirement in natural science (lab).

Notes: Enrollment restricted to students intending to major in engineering. Students who need two semesters of chemistry should enroll in CHEM 211. Credit will not be given for this course and CHEM 211.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

CHEM 300 - Chemistry of Semiconductor Processing

Credits: 3 (NR)
Chemical aspects of the manufacture of semiconductor devices. Topics include oxidation of silicon, photoresists, plasma etching, removal of metal contaminants by acid etching, and analysis of semiconductor thin films.

Prerequisite(s): Completion of 30 credits or permission of instructor.

Notes: Does not satisfy chemistry course requirements for BS in biology. Cannot be used as a chemistry elective toward BA, BS, or minor in chemistry, and does not fulfill premedical requirements.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0

CHEM 313 - Organic Chemistry

Credits: 3 (NR)
Theoretical, synthetic, industrial, and biological aspects of the chemistry of carbon compounds.

Prerequisite(s): Minimum grade of D in CHEM 212.

Corequisite(s): CHEM 315

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHEM 314 - Organic Chemistry

Credits: 3 (NR)
Theoretical, synthetic, industrial, and biological aspects of the chemistry of carbon compounds.

Prerequisite(s): Minimum grade of D in CHEM 313. Prerequisite enforced by registration system.

Corequisite(s): CHEM 318 or CHEM 320.
CHEM 315 - Organic Chemistry Lab I

Credits: 2 (NR)
Lab techniques and reactions arranged to accompany CHEM 313.

Prerequisite(s): Minimum grade of D in CHEM 313.

Corequisite(s): CHEM 313

Notes: One-hour recitation.

CHEM 318 - Organic Chemistry Lab II

Credits: 2 (NR)
Continuation of CHEM 315, arranged to accompany CHEM 314.

Prerequisite(s): Minimum grade of D in CHEM 315. Minimum grade of D in CHEM 314. Prerequisite enforced by registration system.

Corequisite(s): CHEM 314.

Notes: One-hour recitation.

CHEM 321 - Elementary Quantitative Analysis

Credits: 4 (NR)
Principles of chemical analysis emphasizing ionic equilibria. Lab consists of gravimetric, volumetric, and instrumental methods illustrating principal types of quantitative determinations.

CHEM 331 - Physical Chemistry I
CHEM 332 - Physical Chemistry II

Credits: 3 (NR)
Yearlong survey covering topics including thermodynamics, equilibria, kinetics, solution properties, elementary quantum theory, electrochemistry, atomic and molecular structure, and nuclear chemistry.

Prerequisite(s): MATH 113, 114; PHYS 243 or 160

Corequisite(s): PHYS 243 or 160

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

CHEM 333 - Physical Chemistry for the Life Sciences I

Credits: 3 (NR)
Yearlong survey of principles of physical chemistry emphasizing application in biological sciences. Topics include first and second laws of thermodynamics, free energy and chemical equilibria, kinetics, transport properties, molecular interactions, molecular structure, spectroscopy, statistical thermodynamics, and x-ray diffraction.

Prerequisite(s): MATH 113
Corequisite(s): MATH 114

Notes: Credit will not be given for both this course sequence and CHEM 331, 332.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

CHEM 334 - Physical Chemistry for the Life Sciences II

Credits: 3 (NR)
Yearlong survey of principles of physical chemistry emphasizing application in biological sciences. Topics include first and second laws of thermodynamics, free energy and chemical equilibria, kinetics, transport properties, molecular interactions, molecular structure, spectroscopy, statistical thermodynamics, and x-ray diffraction.
Prerequisite(s): CHEM 333; MATH 113, 114

Notes: Credit will not be given for both this course sequence and CHEM 331, 332.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

CHEM 336 - Physical Chemistry Lab I

Credits: 2 (NR)
Quantitative experimental study of physicochemical principles. CHEM 336 and 337 constitute an introduction to the practice and theory of experimental physical chemistry.

Fulfills writing intensive requirement in the major.

Prerequisite(s): CHEM 331
Corequisite(s): CHEM 331

Notes: One-hour recitation.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3

CHEM 337 - Physical Chemistry Lab II

Credits: 2 (NR)
Continuation of CHEM 336.

Prerequisite(s): CHEM 331, 332, 336
Corequisite(s): CHEM 332

Notes: One-hour recitation.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3

CHEM 341 - Fundamental Inorganic Chemistry

Credits: 3 (NR)
Descriptive chemistry including chemical properties, reactions, and reaction mechanisms of inorganic elements and compounds. Topics include main group and transition elements, organometallic compounds, and bioinorganic chemistry.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
CHEM 350 - Computer Techniques for Chemistry

Credits: 3 (NR)
Introduction to computer software, both commercial and online, emphasizing applicability to chemistry topics. Techniques include spreadsheet programming, graphing and statistics, molecular modeling, and chemical information search and retrieval.

Fulfills general education requirement in information technology (all).

Prerequisite(s): CHEM 313.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

CHEM 355 - Undergraduate Research

Credits: 1-3 (RD)
Original research project. May involve lab study, computer modeling and analysis, or other original research as appropriate. Research formulated and completed under instructor's guidance. Culminates in a written and oral final report. May be repeated for a total of 6 credits.

Prerequisite(s): 30 credits, chemistry major or minor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-6

CHEM 422 - Instrumental Analysis

Credits: 3 (NR)
Introduces theories of analysis by instrumental methods. Basic electronics applied to chemical measurements. Topics include introduction to theory of spectroscopy including ultraviolet, visible, and infrared, and electrochemical methods of analysis; theory of Fourier transform techniques such as FT-IR and FT-NMR; and theory of advanced pulse techniques.

Prerequisite(s): CHEM 314, 321, and 331.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

CHEM 423 - Instrumental Analysis Laboratory

Credits: 2 (NR)
Laboratory-based introduction to quantitative analysis of organic and inorganic substances by using modern analytical instrumentation. Laboratory highlights practice of atomic and molecular spectroscopy, spectrophotometry, chromatography, voltammetry, and potentiometry in relation to chemical experimentation.
Prerequisite(s): CHEM 422 or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 6

CHEM 427 - Aquatic Environmental Chemistry

Credits: 3 (NR)
Thermodynamic and kinetic processes regulating the chemistry of surface and groundwater in natural and polluted environments with particular emphasis in explaining the aqueous concentrations of chemical species and controlling geochemical factors in the hydrosphere. Structure, sources and transformations of organic matter in the aquatic environment and interactions with aqueous solutes will be covered as related to contemporary issues in water quality.

Prerequisite(s): CHEM 321 or permission of the instructor.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

CHEM 438 - Atmospheric Chemistry

Credits: 3 (NR)
The fundamental chemical processes of the Earth's atmosphere including chemical cycles, thermodynamics, reaction kinetics, photochemistry, radiative balance, ozone chemistry and environmental issues, including air pollution, acid rain and global change.

Equivalent to CLIM 438

Prerequisite(s): CHEM 331 and 332 or permission of instructor.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

CHEM 441 - Properties and Bonding of Inorganic Compounds

Credits: 3 (NR)
Interpretation of physical and chemical properties of inorganic compounds in terms of currently used bonding concepts. Topics include molecular symmetry and applications of symmetry, structure and bonding in ionic solids; reactions and characterizations of solids; electronic and magnetic properties and applications of solids.

Prerequisite(s): CHEM 211, 212; MATH 113

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

CHEM 445 - Inorganic Preparations and Techniques
Credits: 2 (NR)
Application of techniques of inorganic chemistry to preparation, purification, and spectroscopic characterization of selected substances.

Prerequisite(s): CHEM 321 and 441.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 6

CHEM 446 - Bioinorganic Chemistry

Credits: 3 (NR)
Application of inorganic coordination chemistry and physical methods in study of structure and function of metal ion sites in biomolecules. Properties of transition metal ions, ligand field theory. Topics include iron cytochromes, zinc and copper enzymes, cobalamins, iron sulfur proteins, oxygen transport, iron storage, electron transfer, inorganic model compounds, metals in medicine, and toxicity of inorganic species.

Prerequisite(s): CHEM 463 or BIOL 483

Corequisite(s): CHEM 463 or BIOL 483

Notes: Students may take this course concurrently with CHEM 463 or after taking CHEM 463.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CHEM 451 - Special Projects in Chemistry

Credits: 1-3 (NR)
Introduction to chemical research or development. Includes literature search, conferences, and lab.

Prerequisite(s): Chemistry major or minor, 90 credits, and permission of department research committee.

Notes: Written and oral technical reports required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 6

CHEM 452 - Special Projects in Chemistry

Credits: 1-3 (NR)
Introduction to chemical research or development. Includes literature search, conferences, and lab.

Prerequisite(s): Chemistry major or minor, 90 credits, and permission of department research committee.

Notes: Written and oral technical reports required.
CHEM 455 - Honors Research in Chemistry

Credits: 3 (NR)
Introduction to research on current problem in chemical sciences under supervision of faculty advisor. Includes literature search, laboratory or theoretical work, conferences with faculty advisor, attendance at regularly scheduled seminars, and oral and written presentations.

Prerequisite(s): CHEM 313, 314; CHEM 321; CHEM 331,332

Notes: Credit will not be given for both these courses and CHEM 451, 452.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 6

CHEM 456 - Honors Research in Chemistry

Credits: 3 (NR)
Introduction to research on current problem in chemical sciences under supervision of faculty advisor. Includes literature search, laboratory or theoretical work, conferences with faculty advisor, attendance at regularly scheduled seminars, and oral and written presentations.

Prerequisite(s): CHEM 313, 314; CHEM 321; CHEM 331,332

Notes: Credit will not be given for both these courses and CHEM 451, 452.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 6

CHEM 458 - Chemical Oceanography

Credits: 3 (NR)
The world’s oceans, including a variety of closed basins and estuaries, comprise a complex and dynamic system of chemical processes that interact with biological, geological, physical, and atmospheric processes to play a significant role in defining the earth’s fragile environment. This course will present an overview of the origin, occurrence, and distribution of the chemical components in sea water and an introduction to the basic principals of the chemical processes taking place in the marine environment.

Equivalent to GEOL 458

Prerequisite(s): CHEM 212, and CHEM 321 or GEOL 309

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CHEM 463 - General Biochemistry I

Credits: 4 (NR)
Brief introduction to biochemistry, followed by in-depth look at amino acids and proteins, 3-D structure, folding and dynamics, their specialized function, and primary metabolism. Emphasizes enzymes and their chemical mechanisms, and metabolism.

Prerequisite(s): CHEM 313, BIOL 213. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

CHEM 464 - General Biochemistry II

Credits: 3 (NR)
Continuation of general biochemistry, focusing on secondary metabolism, cell signaling, and processes of replication, transcription, and translation. Emphasizes important biochemistry research topics; much material drawn from current biochemical literature.

Prerequisite(s): CHEM 463/BIOL 483. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

CHEM 465 - Biochemistry Lab

Credits: 2 (NR)
Introduction to modern biochemical experimental methods of studying chemical and physical properties of biological molecules. Includes separation, identification, and characterization of biomolecules.

Fulfills writing intensive requirement in the major.

Corequisite(s): CHEM 463.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 6

CHEM 467 - The Chemistry of Enzyme-Catalyzed Reactions

Credits: 3 (NR)
Examples of enzyme mechanisms demonstrate how chemical principles are employed by living organisms. Specific enzyme mechanisms used to illustrate principles from organic, inorganic, and physical chemistry. Discusses techniques to monitor enzyme reactions.

Prerequisite(s): CHEM 313 and 463.
CHEM 468 - Bioorganic Chemistry

Credits: 3 (NR)
Basic understanding of chemical nature of biomolecules and biomacromolecules. Introduces biomolecules such as amino acids, proteins, carbohydrates, and lipids. Lectures focus on biophysical properties and synthesis, using practical examples and visual aids.

Prerequisite(s): CHEM 314 and 463.

CHEM 470 - Laboratory Instructional Methods for Chemistry

Credits: 3 (NR)
Lecture and laboratory experience teaching chemistry in laboratory. Students work closely with faculty member and are responsible for all aspects of teaching undergraduate laboratory techniques. Students also learn techniques for acquisition and storage of chemicals and laboratory apparatus, safety, disposal of chemical waste, and literature of chemical education.

Prerequisite(s): CHEM 314.

CHEM 490 - Undergraduate Seminar

Credits: 1 (RD)
Selected topics from recent chemical theory and applications, generally consisting of research presentations by invited faculty from other institutions. Attendance is required at 80% of the seminars and students must write up a one-page summary of each talk attended. This course will also be used to teach students how to give effective presentations. May be repeated for a total of 2 credits.

Prerequisite(s): 60 credits and must be a chemistry major or minor.

CHEM 500 - Selected Topics in Modern Chemistry
Credits: 3 (NR)
Topics of interest in analytical, biological, environmental, geological, geochemical, inorganic, organic, and physical chemistry.

Notes: May be repeated for credit with different topics. Credit not allowed toward major in chemistry.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CHEM 505 - Hazardous Materials Waste Management

Credits: 1-3 (NR)
Comprehensive review of subjects most frequently encountered in hazardous chemicals management.

Prerequisite(s): CHEM 313 or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CHEM 513 - Synthetic and Mechanistic Organic Chemistry

Credits: 3 (NR)
General review of synthetic pathways and applications to new topics, emphasizing fused ring aromatics, heterocyclics, natural products, and biologically active compounds. Includes relationship of applied organic chemistry to consumer products, including drugs and agricultural chemicals. Organic core course.

Prerequisite(s): CHEM 313 and 314.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CHEM 521 - Theory of Analytical Processes

Credits: 3 (NR)
Theory of signal and noise, mass transport phenomena, thermodynamics, and ionics in analytical chemistry. Applications made to Fourier transform techniques such as FT-IR and FT-NMR, convolution and correlation spectroscopy, chemical sensors, chromatography, flow injection analysis, ion transport in membrane, and interpretation of analytical signals. Analytical core course.

Prerequisite(s): CHEM 422 or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CHEM 529 - Instrumental Techniques of Analysis
Principles and operation of modern instrumentation, emphasizing applications to analysis of chemical, biological, and environmental samples. Methods include combined capillary column gas chromatography and mass spectrometry, high-performance liquid chromatography, optical methods, surface analysis methods, magnetic resonance spectroscopy, atomic emission and absorption spectrometry, and electroanalytical methods. With approval of research committee, students choose methods studied.

**Prerequisite(s):** CHEM 321 and 422 or 521, or permission of department.

**Hours of Lecture or Seminar per week:** 1-6
**Hours of Lab or Studio per week:** 6

**CHEM 531 - Elements of Physical Chemistry**

Credits: 3 (NR)

Intensive overview of concepts, techniques, and models of physical chemistry as they apply in many branches of chemistry and allied sciences. Topics include properties of gases, first and second laws of thermodynamics, phase and chemical equilibrium, chemical kinetics, atomic and molecular structure, and spectroscopy. Emphasizes developing practical skill in using tools of physical chemistry. Extensive use of spreadsheet models to investigate chemical and physical systems.

**Prerequisite(s):** CHEM 211, 212; CHEM 313, 314; PHYS 243, 245; MATH 113; or permission of instructor.

**Hours of Lecture or Seminar per week:** 2
**Hours of Lab or Studio per week:** 0

**CHEM 554 - Geochemistry of Environmental Hazards**

Credits: 3 (NR)

Introduction to origins and reactions of hazardous substances in air, water, and soil environments. Covers movement of trace organic and inorganic substances in geochemical cycle, with particular reference to transport processes that influence air and water quality.

**Prerequisite(s):** CHEM 314 or permission of instructor.

**Hours of Lecture or Seminar per week:** 2
**Hours of Lab or Studio per week:** 3

**CHEM 563 - General Biochemistry I**

Credits: 4 (NR)

Brief introduction to biochemistry, followed by an in-depth look at amino acids and proteins, 3-D structure, folding and dynamics, their specialized function and primary metabolism. Emphasizes enzymes and their chemical mechanisms and metabolism. Students will be assigned papers from the primary literature and be required to answer questions from these papers on exams.

**Prerequisite(s):** CHEM 313; BIOL 213.
CHEM 564 - General Biochemistry II

Credits: 3 (NR)
Previous course in biology recommended but not required. Important biological compounds, including proteins, carbohydrates, lipids, and nucleic acids, and their interrelations.

Prerequisite(s): CHEM 563 or equivalent.

CHEM 567 - The Chemistry of Enzyme-Catalyzed Reactions

Credits: 3 (NR)
Examples of enzyme mechanisms demonstrate how chemical principles are employed by living organisms. Specific enzyme mechanisms used to illustrate principles from organic, inorganic, and physical chemistry. Discusses techniques to monitor enzyme reactions.

Prerequisite(s): CHEM 313 and 463 or permission of instructor.

CHEM 568 - Bioorganic Chemistry

Credits: 3 (NR)
Basic understanding of chemical nature of biomolecules and biomacromolecules. Introduces biomolecules such as amino acids, proteins, carbohydrates, and lipids. Lectures focus on biophysical properties and synthesis, using practical examples and visual aids.

Prerequisite(s): CHEM 314 and 463, or equivalent, or permission of instructor.

CHEM 579 - Special Topics

Credits: 1-6 (RT)
Current topics in chemistry, depending on instructor's specialty.

Prerequisite(s): CHEM 313 and 314 or permission of instructor.
CHEM 613 - Modern Polymer Chemistry

Credits: 3 (NR)
Synthetic and analytical chemistry of synthetic macromolecules. Topics include polymer solutions, molecular weight determination, spectroscopy, thermal analysis, x-ray crystallinity, polymerization types, and commercial and electroactive polymers. Organic core course.

CHEM 614 - Physical Organic Chemistry

Credits: 3 (NR)
Principles underlying molecular structure, reactivity, and reaction mechanisms. Topics include valence-bond and molecular-orbital theory, electronic interpretation of organic reactions, stereochemistry, conformational analysis, kinetics and thermodynamics of organic reactions, and photochemistry. Organic core course.

Prerequisite(s): CHEM 314 or permission of instructor.

CHEM 617 - Organic Structural Spectroscopy

Credits: 3 (NR)
Spectroscopic determination of organic molecular structure using $^{1}H$, $^{13}H$, $^{19}F$, and $^{31}P$ nuclear magnetic resonance spectroscopy and infrared, mass, ultraviolet and visible, and Raman spectroscopy. Organic core course.

Prerequisite(s): CHEM 314 or equivalent.

CHEM 620 - Modern Instrumentation

Credits: 3 (NR)
Methods of sensing and measurement of radiation, particles, pressure, concentrations of specific elements and compounds. Topics include basic operational amplifier circuits for analog signals, digitizing devices and computerized data collection, noise...
and noise-reduction methods, and specialized instrumentation systems for various areas of chemistry and physics.

Equivalent to PHYS 533

**Prerequisite(s):** CHEM 422 or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 2

**CHEM 624 - Principles of Chemical Separation**

Credits: 3 (NR)  
Theories and models of separation with applications to analyses of a wide range of chemical, biological, and environmental samples. Topics include high-resolution gas and high-performance liquid chromatography. Emphasizes theory of reverse phase, normal phase, ion exchange, size exclusion, and affinity based separations. Also presents instrumentation such as detectors, pumps, and columns, and data acquisition. Analytical core course.

**Prerequisite(s):** CHEM 422 or 521, or permission of instructor.

**Hours of Lecture or Seminar per week:** 5  
**Hours of Lab or Studio per week:** 0

**CHEM 625 - Electroanalytical Chemistry**

Credits: 3 (NR)  
Review of basic electrochemistry. Emphasizes analysis and research for applications of modern electrochemical techniques such as chronoamperometry; cyclic, stripping, and AC voltammetry; pulse polarography; coulometry; electrochemical sensors; and instrumentation.

**Prerequisite(s):** CHEM 321 and 331.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**CHEM 633 - Chemical Thermodynamics and Kinetics**

Credits: 3 (NR)  
Advanced study covering application of kinetics to the elucidation of reaction mechanisms, and application of statistical thermodynamics to theory of elementary reaction rates. Physical core course.

Equivalent to CSI 711

**Prerequisite(s):** CHEM 331 and 332.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 0
CHEM 641 - Solid State Chemistry

Credits: 3 (NR)
This course will focus on the design and synthesis, structure and bonding of solid state compounds; physical properties and characterization of solids. Topics of current interest will also be included.

Prerequisite(s): CHEM 441 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

CHEM 646 - Bioinorganic Chemistry

Credits: 3 (NR)
Applies inorganic coordination chemistry and physical methods to understand structure and function of metal ion sites in biomolecules. Biochemical roles of metal centers in oxygen transport, metalloenzymes, and electron transfer. Topics include iron cytochromes, zinc and copper enzymes, cobalamins, iron sulfur proteins, inorganic model compounds, and metals in medicine. Inorganic core course.

Prerequisite(s): CHEM 441 or permission of instructor.

Hours of Lecture or Seminar per week: 5
Hours of Lab or Studio per week: 0

CHEM 651 - Environmental Chemistry of Organic Substances

Credits: 3 (NR)

Prerequisite(s): One semester of physical chemistry, or permission of instructor.

Hours of Lecture or Seminar per week: 2 or 3
Hours of Lab or Studio per week: 0

CHEM 660 - Protein Biochemistry

Credits: 3 (NR)
Proteins play critical roles in most biological processes. Therefore, to understand these processes, it is necessary to understand proteins. This course will introduce students to proteins, their biosynthesis/biodegradation and their biophysical and biochemical properties. Biochemistry core course.

Prerequisite(s): CHEM 463 or equivalent or permission of instructor.
CHEM 661 - Antibiotic Chemistry and Resistance

Credits: 3 (NR)
This course will introduce the various classes of antibiotics. The focus will be on the chemistry of antibiotics and how they inhibit bacterial growth and/or cause death and the response of bacteria to these compounds.

Prerequisite(s): CHEM 463 (or equivalent), or permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CHEM 662 - Modern Methods of Drug Discovery

Credits: 3 (NR)
Introduction to the process of drug discovery. Covers modern methods and strategies of target identification, lead identification, and lead optimization. Biochemistry core course.

Prerequisite(s): CHEM 463 (or equivalent), or permission of instructor.

Hours of Lecture or Seminar per week: 1-9
Hours of Lab or Studio per week: 0

CHEM 665 - Protein-Protein Interactions: Methods and Applications

Credits: 3 (NR)
Introduction to the fundamental principles of protein-protein interactions, including experimental design considerations and methods for quantification of these interactions.

Prerequisite(s): CHEM 463 (or equivalent), or permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CHEM 670 - Teaching Practicum

Credits: 1-2 (NR)
Prelaboratory lecture and laboratory teaching in chemistry. Students work closely with faculty and are responsible for all aspects of teaching undergraduate laboratory techniques.

Prerequisite(s): Enrollment in the graduate program and permission of Chair. Lecture and lab experience teaching chemistry in George Mason University
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CHEM 728 - Introduction to Solid Surfaces

Credits: 3 (NR)
Introduces properties of solid surfaces. Topics include gas adsorption isotherms, surface area measurement techniques, real and clean surfaces, physisorption and chemisorption, methods of gas adsorption and desorption, measurement of heats of adsorption, desorption kinetics, electron spectroscopies and surface sensitivities, instrumentation; and principles of vacuum technology.

Equivalent to CSI 712

Prerequisite(s): CHEM 422 or equivalent.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CHEM 732 - Quantum Chemistry

Credits: 3 (NR)
Illustration of fundamental concepts of quantum mechanics with applications to chemical systems, including atomic and molecular electronic structure and properties, molecular symmetry, and intermolecular forces. Physical core course.

Equivalent to CSI 713

Prerequisite(s): CHEM 332 or equivalent.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CHEM 733 - Polymer Physical Chemistry

Credits: 3 (NR)
Physical chemistry of macromolecules including molecular weight, conformation, configuration, characteristics of the glassy state, methods for studying polymer morphology (XRD, SEM, TEM, optical microscopy), electronic structure and behavior, band theory, conduction mechanisms, intrinsically conductive polymers, polarization, dielectric behavior, triboelectric behavior, piezoelectric behavior, and nonlinear optical properties.

Prerequisite(s): CHEM 332 or equivalent; or permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
CHEM 735 - Astrophysical Chemistry of Planetary Bodies

Credits: 3 (NR)
In depth review of the chemistry of planets, comets and other bodies in the Solar System. Emphasis will be placed on the laboratory techniques and measurements made in order to understand and predict astronomical observations.

Prerequisite(s): CHEM 331, or ASTR 403, or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CHEM 736 - Computational Quantum Mechanics

Credits: 3 (NR)
Study of fundamental concepts of quantum mechanics from computational point of view, review of systems with spherically symmetric potentials, electron-atom solutions to Schrodinger's equation, electron spin in many electron systems, atomic structure calculations, algebra of many electron calculations, Hartree-Fock, self-consistent field method, molecular structure calculations, scattering theory computations, and solid-state computations.

Equivalent to CSI 783/PHYS 736

Prerequisite(s): PHYS 502, 510, or permission of instructor.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0

CHEM 767 - Industrial Biochemistry

Credits: 3 (NR)
An introduction to industrial biochemistry. Includes a mechanistic examination of the biosynthesis of several industrially important secondary metabolites, the industrial scale process of obtaining commercially valuable biochemical products, and the regulations that oversee the industrial biochemical process.

Prerequisite(s): CHEM 463 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

CHEM 790 - Graduate Seminar

Credits: 1 (RD)
Selected topics from recent chemical theory and applications, generally consisting of research presentations by invited faculty from other institutions. Attendance is required at 80% of the seminars and students must write up a 1 page summary of each talk attended. This course will also be used to teach students how to give effective presentations.

Prerequisite(s): Admission to a graduate program in Chemistry and Biochemistry, or permission of instructor.
Notes: Requires, in last semester, seminar presentation on student's research or another topic acceptable to department. Three credits of CHEM 790 required for MS degree; an additional 3 credits required after admission to PhD program.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**CHEM 796 - Directed Reading and Research**

Credits: 1-6 (RD)  
Reading and research on a specific topic in chemistry or biochemistry under direction of a faculty member. May be repeated for a total of 12 credits.

**Prerequisite(s):** Admission to a graduate program in chemistry and biochemistry or affiliated programs.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 1-6

**CHEM 798 - Research Project**

Credits: 3-6 (RD)  
Experimental or theoretical research project chosen and completed under guidance of graduate faculty member.

**Prerequisite(s):** Permission of department; 6 credits of CHEM 798 or 799, but credit will not be given for both.

**Notes:** Requires comprehensive report acceptable to advisory committee, and final oral exam on report.

**Hours of Lecture or Seminar per week:** 1-12  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No credit only

**CHEM 799 - Master's Thesis**

Credits: 1-6 (RD)  
Laboratory thesis research and writing under direction of supervisor.

**Prerequisite(s):** Permission of department.

**Notes:** Minimum of 3 credits for first two enrollment periods.

**Hours of Lecture or Seminar per week:** 1-12  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

**CHEM 814 - Advanced Bioorganic Chemistry**
Credits: 3 (NR)
This course is intended to provide students with an introduction to the chemical nature of biomolecules, with a focus on their organic properties. The course will focus on the chemical principals that underlie the diverse structures, properties and reactions of biomolecules. This is a core course in the Chemistry and Biochemistry doctoral program.

Prerequisite(s): CHEM 313, 314, and 463 or equivalent; or permission from instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

CHEM 821 - Theory of Analytical Processes

Credits: 3 (NR)
Theory and application of contemporary analytical processes and methods used in chemistry research. Emphasis on analytical signals and accompanying noise, sample preparation techniques, and quality assurance in measurements. This is a core course in the Chemistry and Biochemistry doctoral program.

Prerequisite(s): Admission to Chemistry and Biochemistry doctoral program.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0

CHEM 833 - Physical Chemistry and Biochemistry

Credits: 3 (NR)
The theory and practical use of thermodynamics, kinetics, spectroscopy and quantum chemistry in chemical and biochemical research. This is a core course in the Chemistry and Biochemistry doctoral program.

Prerequisite(s): CHEM 331 or permission of instructor.

Hours of Lecture or Seminar per week: 2-4
Hours of Lab or Studio per week: 0

CHEM 891 - Doctoral Scientific Critique, Writing and Presentation

Credits: 3 (NR)
Development of skills associated with scientific communication and research such as oral presentation of scientific material, analysis of scientific research and preparation of scientific proposals. In preparing scientific proposals, students will learn how to identify scientific questions of interest and how to plan a course of experiments to address these questions. This is a core course in the Chemistry and Biochemistry doctoral program.

Prerequisite(s): Permission of academic advisor, research advisor and/or research committee.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
CHEM 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Development of a research proposal under the guidance of the research advisor and graduate committee. The resulting proposal, once approved by the student's research advisor and committee forms the basis of the student's doctoral dissertation. May be repeated for credit, but no more than 24 combined credits from CHEM 998 and CHEM 999 may be applied toward satisfying doctoral degree requirements, with no more than 12 credits of CHEM 998.

Prerequisite(s): Permission of research advisor and/or graduate committee.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
Grading: Satisfactory/No credit only

CHEM 999 - Doctoral Dissertation Research

Credits: 1-12 (RD)
Research in the concentration pertinent to student's program of study under the direction of their research advisor and committee. Students may enroll for credits in this course once their research proposal has been approved. May be repeated for credit, but no more than 24 combined credits from CHEM 998 and CHEM 999 may be applied toward satisfying doctoral degree requirements, with no more than 12 credits of CHEM 998.

Prerequisite(s): Admission to candidacy in Chemistry and Biochemistry Doctoral Program.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
Grading: S/IP

Chinese (CHIN)

Offered by the College of Humanities and Social Sciences

CHIN 101 - Elementary Chinese

Credits: 3 (NR)
Introduction to Mandarin, including basic grammar, oral expression, listening comprehension, reading, and writing.

Notes: Students may not receive credit for CHIN 101 and CHIN 109 or 110.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

CHIN 102 - Elementary Chinese
Credits: 3 (NR)
Continuation of CHIN 101.

Prerequisite(s): CHIN 101.

Notes: Students may not receive credit for CHIN 102 and CHIN 109 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 109 - Intensive Elementary Chinese

Credits: 6 (NR)
Recommended for students who desire training in Chinese language to an intermediate level of competence in a relatively short period of time.

Notes: Equivalent to CHIN 101 and 102 taught in single semester. Students may not receive credit for CHIN 109 and CHIN 101, 102, or 110.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

CHIN 110 - Elementary Chinese

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Lab work required. Students may not receive credit for CHIN 110 and CHIN 101, 102, or 109.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 1

CHIN 201 - Intermediate Chinese I

Credits: 3 (NR)
Further development of skills acquired in CHIN 101 and 102, including grammar, oral expression, listening comprehension, reading, and writing.

Prerequisite(s): CHIN 101 and 102.

Notes: CHIN 201 and 202 must be taken in sequence. Students may not receive credit for CHIN 201 and CHIN 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CHIN 202 - Intermediate Chinese II

Credits: 3 (NR)
Continuation of CHIN 201.

Prerequisite(s): CHIN 201 or equivalent.

Notes: Students may not receive credit for CHIN 202 and CHIN 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 209 - Intensive Intermediate Chinese

Credits: 6 (NR)
Recommended for students who desire training in Chinese to an intermediate level of competence in a relatively short period of time.

Prerequisite(s): CHIN 102, 109, appropriate placement score, or permission of instructor.

Notes: Equivalent to CHIN 201 and 202 taught in single semester. Students may not receive credit for CHIN 209 and CHIN 201, 202, or 210.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

CHIN 210 - Intermediate Chinese

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Chinese-speaking regions.

Prerequisite(s): CHIN 110 or appropriate placement score.

Notes: Students may not receive credit for CHIN 210 and CHIN 201, 202, or 209.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 250 - Gateway to Advanced Chinese

Credits: 3 (NR)
Integration of advanced intermediate-level Chinese reading, writing, listening, and speaking skills, and the development of critical thinking about authentic texts from around the globe.
Prerequisite(s): CHIN 210, appropriate placement score, or permission of department.

Notes: Taught in Chinese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 300 - Reading Skills Development

Credits: 3 (NR)
Develops reading proficiency, emphasizing vocabulary and grammar of standard written Chinese. Introduces discourse structure, sociolinguistic and cultural knowledge, and strategies for reading Chinese at an advanced level.

Prerequisite(s): CHIN 250, appropriate placement score, or permission of instructor.

Notes: Taught in Chinese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 301 - Advanced Grammar and Syntax

Credits: 3 (NR)
In-depth review of Chinese grammar and syntax. Provides extensive practice in controlled and free writing, emphasizing fundamental difficulties and points of interference between English and Chinese.

Prerequisite(s): CHIN 250 or equivalent; appropriate placement score; or permission of instructor.

Notes: Taught in Chinese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 305 - Chinese for the Business World

Credits: 3 (NR)
Introduces terminology and structure of business Chinese. Emphasizes acquiring vocabulary and developing facility in Chinese business articles and correspondence.

Prerequisite(s): CHIN 250 or equivalent; appropriate placement score; or permission of instructor.

Notes: Taught in Chinese. May be repeated for credit once with permission of department when content is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CHIN 310 - Survey of Chinese Literature

Credits: 3 (RD)
Introduces outlines of Chinese literature to the 19th century, presented through literary sources arranged in roughly chronological order. Readings include poetry; fiction; personal essays; documents of philosophy, history, and religion; and transcribed oral records.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101, or permission of instructor.

Notes: Taught in English. Knowledge of Chinese helpful but not required. May be repeated for a maximum of 6 credits when topic is different with approval of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 311 - Modern Chinese Literature in Translation

Credits: 3 (RT)
Introduction of outlines of modern Chinese literature from early 20th century to post-Mao era, presented through literary sources arranged in roughly chronological order. Readings include poetry, fiction, personal essays.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101, or permission of instructor.

Notes: Taught in English. Knowledge of Chinese helpful but not required. May be repeated for a maximum of 6 credits when topic is different with approval of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 318 - Introduction to Classical Chinese

Credits: 3 (NR)
Introduces basic structures and vocabulary of Classical Chinese, which still has a significant influence on the formal written prose of modern newspapers and documents.

Prerequisite(s): CHIN 250, appropriate placement score, or permission of instructor.

Notes: Taught in Chinese. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 320 - Contemporary Chinese Film
Explores China from 1949 to present through cinematic and literary representations. Discussions focus on representations of cultural, social, and political changes in the movies. Also introduces critical readings that address issues of gender and youth, family, ethnicity, modernity and the nation, as well as visuality and memory.

Notes: Taught in English. Knowledge of Chinese language helpful but not required. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 325 - Major Chinese Writers

Credits: 3 (RD)
Studies works of major Chinese writers. Writers studied may vary.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101, or permission of instructor.

Notes: Taught in English. Knowledge of Chinese helpful but not required. May be repeated for a maximum of 6 credits when topic is different with approval of department. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 328 - Asian American Women Writers

Credits: 3 (NR)
Introduction to selected works by female writers of Chinese, Filipino, Indian, Japanese, and Korean descent. Analyzes themes, form, style, language, and structure of a variety of works, mainly novels and short stories. Assesses role and significance of writings as part of ethnic American and women's literature by exploring questions of identity formation and disintegration, and how they are rooted in gender, social status, ethnicity, community, geography, and generational conflict.

Fulfills general education requirement in literature.

Notes: Taught in English. Knowledge of Asian languages not required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 355 - Readings in Chinese Poetry and Poetics

Credits: 3 (RD)
Close readings and discussions of primary texts covering major periods in Chinese poetry to 1949. Analyzes variety of themes, forms, and styles.
Prerequisite(s): CHIN 300 or permission of instructor.

Notes: Taught in Chinese. May be repeated for a maximum of 6 credits when readings are different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 365 - Readings in Chinese Fiction after Mao

Credits: 3 (RD)
Close readings and discussions of primary texts after the Cultural Revolution. Analyzes themes, subjects, language, and styles.

Prerequisite(s): CHIN 300 or permission of instructor.

Notes: Taught in Chinese. May be repeated for a maximum of 6 credits when readings are different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 470 - Special Topics in Chinese Studies

Credits: 3 (RD)
Covers topics on Chinese language, literature, or culture organized by theme, genre approach, or era.

Notes: Taught in Chinese. May be repeated once for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 480 - Fourth-Year Chinese I

Credits: 3 (NR)
Advanced work in major grammatical and lexical topics of Chinese. Applies theoretical principles to guided written and oral exercises.

Prerequisite(s): CHIN 300 and 301; appropriate placement score or permission of instructor.

Notes: Taught in Chinese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CHIN 481 - Fourth-Year Chinese II

Credits: 3 (NR)
Advanced work in major grammatical and lexical topics of Chinese. Applies theoretical principles to guided written and oral exercises.

Prerequisite(s): CHIN 300, 301, 480; and appropriate placement score or permission of instructor.

Notes: Taught in Chinese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CHIN 490 - Internship in Chinese Studies

Credits: 1-9 (RT)
Work with schools, social service programs, government agencies, interest groups, museums, or corporations locally and in Chinese-speaking regions. With a faculty supervisor, students develop an internship contract, which requires the approval of the director. For each credit, student works on site at least 45 hours.

Prerequisite(s): CHIN 210 or equivalent.

Notes: Contact the department one semester prior to enrollment. May be repeated for a maximum of 9 credits.

Hours of Lecture or Seminar per week: 1-9
Hours of Lab or Studio per week: 1-12

Civil and Infrastructure Engineering (CEIE)

Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.

CEIE 100 - Environmental Engineering around the World

Credits: 3 (NR)
Introduces environmental engineering as practiced in different societies around the world. Environmental engineering is broadly defined as organizational and physical infrastructure to manage natural resources. Focuses on how different societies today and in the past have responded to environmental challenges related to engineering opportunities. Issues include construction of large dams to manage river systems; use of forecast climate and weather data to improve agriculture, emergency response, or water supply; collection and treatment of wastewater; public health and pollution control; disposal of waste nuclear materials; and management of significantly polluted sites.

Fulfills general education requirement in global understanding.
CEIE 102 - Sustainable Cities, Sustainable Villages I

Credits: 1 (NR)
Engages students in the process of becoming sustainable civil engineering practitioners. Presents concepts that relate to current practice in planning, designing and managing sustainable infrastructures. Introduces contemporary tools for measuring and evaluating sustainable design, development and operation.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

CEIE 117 - Information Technology for Engineering

Credits: 3 (NR)
Introduces elements of computing essential for engineering students. Topics include hardware fundamentals; number systems; data types; variables; expressions; information process modeling with flow charts; data transmission; arrays; integer and floating point arithmetic; pseudo code development; spreadsheet modeling; scripting and rapid prototyping; fundamentals of web technology; and legal and ethical considerations (including privacy, intellectual property, and appropriate uses of technology).

Fulfills general education requirement in information technology (all).

Equivalent to ENGR 117 (2011-2012 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

CEIE 202 - Sustainable Cities, Sustainable Villages II

Credits: 1 (NR)
Engages students in the process of becoming sustainable civil engineering practitioners. Students integrate current practice in planning, designing and managing sustainable infrastructure. Contemporary tools for measuring and evaluating sustainable design, development and operation are used in the analysis of a civil engineering system.

Prerequisite(s): C or better in CEIE 102 and sophomore standing. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

CEIE 203 - Geomatics and Engineering Graphics
This course introduces topographic surveying and engineering drawing for civil engineering applications. Topics include surveying, GPS, GIS, digital terrain modeling, design of horizontal and vertical curve geometry for road applications, engineering drawing concepts, and drawing with CAD-based software. Field work required on selected topics.

**Prerequisite(s):** C or better in ENGR 117 or CEIE 117 or CS 112. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

### CEIE 210 - Statics and Dynamics

Credits: 3 (NR)  
Covers general principles and fundamental concepts, including units or measurement; force vectors and their use, including vector operations; equilibrium of a particle; resultants or a system or forces; equilibrium or a rigid body; dry friction; center or gravity and centroid; moments of inertia, including parallel axis theorem and radius of gyration; kinematics or a particle.

Equivalent to ENGR 210 (2011-2012 Catalog)

**Prerequisite(s):** Grade of C or better in PHYS 160 and MATH 114. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

### CEIE 240 - Hydraulics

Credits: 3 (NR)  
Principles of fluids in equilibrium and motion. Topics include hydrostatic pressure; continuity, Bernoulli, and momentum equations; viscosity flow problems; pressure pipe flow and turbomachinery; measuring instruments; and applications to closed conduits and open channels.

Equivalent to CEIE 230 (2011-2012 Catalog)

**Prerequisite(s):** C or better in PHYS 160. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

### CEIE 290 - Engineering Computation and Design

Credits: 3 (NR)  
Introduces civil engineering design process. Includes methods, technologies for spatial data acquisition, emphasizing land measurements, mapping, and surveying. Covers processing field data to incorporate into computer-aided design systems; conversion of raw data into finished design documents, including schematic layouts, digital terrain models, preliminary plans,
topographic maps, detailed design plans, cut sheets, cross-sections and profiles; 2D and 3D computer-aided design techniques; and application of digital computation. Includes design projects.

**Prerequisite(s):** Grade of C or better in ENGR 183. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 3  
**When Offered:** Fall, Spring

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**CEIE 301 - Engineering and Economic Models in Civil Engineering**

Credits: 3 (NR)  
Applies planning, analysis, control, and engineering economic models to life cycle of physical infrastructure. Introduces infrastructure design process and application of quantitative and probabilistic models. Presents applications of model building for engineering economics; decision making; forecasting; resource scheduling and allocation; estimating; work measurement and materials; and quality and process control in water, transportation, environmental, energy, and telecommunications infrastructure systems and the built environment.

**Prerequisite(s):** Grade of C or better in STAT 344 and ENGH 302. Prerequisite enforced by registration system.

**Notes:** Fulfills writing-intensive requirement for civil and infrastructure engineering major.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**CEIE 302 - Sustainable Cities, Sustainable Villages III**

Credits: 1 (NR)  
Students apply sustainable civil engineering principals in the design of an infrastructure system. Students learn how to integrate contemporary topics in the planning, design and management of sustainable infrastructure. Tools for measuring and evaluating the sustainability of the design, development and operation of a civil engineering system are applied.

**Prerequisite(s):** C or better in CEIE 202 and Junior standing. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

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**CEIE 304 - Jr Engineering Competency Exam**

Credits: 0 (RT)  
Assess student preparation for the Fundamentals of Engineering exam after completing engineering science requirements for a BS degree in engineering.

**Prerequisite(s):** C or better in MATH 114 and PHYS 260. Prerequisite enforced by registration system.
CEIE 310 - Mechanics of Materials

Credits: 3 (NR)
Concepts of stress, strain, elasticity, and plasticity. Stress and strain transformation, including the use of Mohr's circle. Pure torsion. Theory of pure bending and members under transverse loading, including normal and shear stress analysis. Theory of elastic buckling. Distribution of internal forces in statically determinate systems and deflection of beams.

Equivalent to ENGR 310 (2011-2012 Catalog)

Prerequisite(s): Grade of C or better in ENGR 210 or CEIE 210. Prerequisite enforced by registration system.

CEIE 311 - Structural Analysis

Credits: 3 (NR)
Basic concepts and assumptions of structural analysis, including statical and geometric redundancy. Analysis, by integration of deformation of simple structural members. Virtual work method for the analysis of deformations of simple structural systems such as articulate beams, trusses, frames, and arches. Method of forces to analyze statically indeterminate systems, method of displacements to analyze geometrically indeterminate systems, and symmetry and antisymmetry in structural analysis. Uses computer programs for structural analysis.

Prerequisite(s): Grade of C or better in CEIE 310 or ENGR 310. Prerequisite enforced by registration system.

CEIE 331 - Soil Mechanics

Credits: 3 (NR)
Covers soil classification, soil properties and engineering characteristics of soils. Includes seepage effects, effective stresses, soil strength and deformation characteristics. Also, the determination of immediate and consolidation settlement, lateral earth pressures and bearing capacities. Introduces foundation design fundamentals.

Equivalent to CEIE 305 (2011-2012 Catalog)

Prerequisite(s): Grade of C or better in ENGR 210 or CEIE 210. Prerequisite enforced by registration system.
CEIE 340 - Water Resource Engineering

Credits: 3 (NR)
Introduces principles and practice of water resources engineering. Topics include hydrology, governing principles, design and evaluation methods, common models, and typical applications in water resource engineering. Laboratory and field work required on selected topics.

Prerequisite(s): Grade of C or better in CEIE 240 or CEIE 230. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

CEIE 355 - Environmental Engineering and Science

Credits: 3 (NR)
Introduces students to the concepts of water pollution, air pollution, noise, and solid waste generation and management. Relationships between human population growth and pollution are introduced. Contemporary environmental engineering topics such as sustainability and global climate change are presented. Designated a Green Leaf Course.

Prerequisite(s): Grade of C or better in (CEIE 230 or CEIE 240) and (CHEM 211 or CHEM 251). Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CEIE 360 - Introduction to Transportation Engineering

Credits: 3 (NR)
Introduces transportation systems and the factors that influence their planning, design, and operation. Topics include fundamentals of urban travel, travel demand forecasting, and traffic flow; principles of highway design; highway capacity and level of services; introduction to traffic control; traffic signal control systems; intersection design; speed zoning and control; and introduction to Intelligent Transportation Systems and travel demand management. Requires laboratory, field work on selected topics.

Fulfills writing intensive requirement in the major.

Prerequisite(s): Grade of C or better in (ENGR 210 or CEIE 210), and (CEIE 290 or CEIE 203) and Satisfactory in CEIE 304. Prerequisite enforced by registration system.
CEIE 370 - Construction Systems

Credits: 3 (NR)
Overview of the modern construction industry and principles and practices of construction management. Topics include project planning, construction administration, the contract environment, equipment operations, cost estimation and scheduling, and legal theories. Current industry trends are emphasized as are the uses of modern scheduling and cost-estimating software and online databases.

Prerequisite(s): Grade of C or better in (CEIE 290 or CEIE 203) and CEIE 301. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CEIE 400 - Civil Engineering Planning and Management

Credits: 3 (NR)
Quantitative and qualitative analysis in planning, design, construction, and management of engineering systems and facilities. Introduces policies, programs, and regulations that influence land development, history-enabling legislation, governing and regulating bodies, control of site plan development, and approval process. Examines structure, function, and purpose of urban design systems and how they can be achieved. Discusses physical relationships among development, land use, transportation, energy, communications, and water systems. Studies public- and private-sector urban development industry. Other topics include innovation, competition, new technology, and environmental issues. Requires design projects.

Prerequisite(s): Grade of C or better in CEIE 340 and CEIE 360. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CEIE 401 - Sustainable Land Development

Credits: 3 (NR)

Introduces students to sustainable land development topics including low impact development, site resource conservation, ultra low water design, deconstruction and materials reuse, healthy building design, green house gas reduction, zero and low energy design, and other topics related to sustainable practices in facilities and infrastructure design and construction. Designated a Green Leaf Course.

Prerequisite(s): Grade of C or better in CEIE 355, CEIE 340 and CEIE 360. Prerequisite enforced by registration system.

Corequisite(s): CEIE 400
CEIE 402 - Highway Design and Construction

Credits: 1.5 (NR)
This laboratory course provides a survey of the tools, techniques, and methods used by the various civil engineering off-campus at disciplines to design and construct highways. The course combines lectures, Individual readings, and hands-on exposure to the tools and processes used by planning, environment, project management, survey and mapping, preliminary design, geotechnical, pavements, hydraulics, bridge design, PS&E design, materials, and construction.

Prerequisite(s): Senior CEIE status.

Notes: Course meets off-campus at the federal Highway Administration Eastern Federal Lands Highway Division in Sterling, VA.

CEIE 403 - Experimental Methods in Civil Engineering

Credits: 1.5 (NR)
This laboratory course surveys common testing and laboratory experimental methods that civil engineers encounter in their professional practice and in research settings. Students fabricate specimens of civil engineering materials and conduct experiments in the following laboratories at the Federal Highway Administration's Turner-Fairbank Highway Research Center: concrete and Steel Materials Lab, Structure Lab, Hydraulic Lab, Geotechnical Lab and Asphalt Lab.

Prerequisite(s): Senior CEIE status.

Notes: Course meets off-campus at the Federal Highway Administration's Turner-Fairbank Highway Research Center in McLean, VA.

CEIE 404 - Sr Engineering Competency Exam

Credits: 0 (RT)
Assess student preparation for the Fundamentals of Engineering exam after completing engineering design electives required for a BS degree in engineering.

Prerequisite(s): Satisfactory grade in CEIE 304. Prerequisite enforced by registration system.
CEIE 409 - Professional Practice and Management in Engineering

Credits: 1 (NR)
This course introduces professional ethics and management principles, and prepares students for leadership roles in practice. Topics include introduction to professional and technical societies; code of ethics related to the public, clients, contractors, suppliers, employers, agreements, contracts, competitive bidding, the engineering profession, conflict of interest, legal responsibilities and case law; case studies in professional ethics; professional licensure; engineering versus engineering management; personal development; managing culture shock, time management, career versus grad school, continuing education; public policy considerations in engineering practice; practical considerations in project management; effectively communicating with employees, contractors and clients; marketing, competitive bidding and project selection; conflict resolution; and managing a small business.

Fulfills general education requirement in information technology (ethics only).

Equivalent to ENGR 401 (2011-2012 Catalog)

Prerequisite(s): Senior standing.

CEIE 410 - Geographic Information Systems in Engineering

Credits: 3 (NR)
Introduces geographic information systems (GIS) and their application in environmental, transportation, land-use planning, and other situations. Explores methods, technologies for spatial data acquisition, specification, storage, manipulation, query, thematic analysis, presentation, and application in the design process. Introduces relationships, integration of GIS with computer-aided design and global positioning system. Hands-on projects.

Prerequisite(s): Grade of C or better in CS 112, ENGR 117 or CEIE 117 and CEIE 360 and CEIE 355. Prerequisite enforced by registration system.

Notes: Credit is not given for both CEIE 410 and 510.

CEIE 411 - Introduction to Design and Inventive Engineering

Credits: 3 (NR)
Outlines major stages of design process. Covers conceptual versus detailed design; design evaluation. Covers applications of
Artificial Intelligence (AI) in design, including evolutionary computation. Covers inventive problem-solving methods, including brainstorming, Synectics, TRIZ, and morphological analysis. Includes computer tools to support design creativity. Features collaborative design: fundamentals and group projects dealing with civil engineering problems provided by industry.

**CEIE 412 - Structural Steel Design**

Credits: 3 (NR)
Structural design process, steel material and shapes, steel behavior, specs and codes, LRFD/ASD, loads, gravity and lateral systems, bracings, tributary areas, tension members design; shear lag, net area, load transfer, column design; column strength curve, effective length approach, local buckling, beam design, lateral-torsional buckling, unbraced length, noncompact and compact, deflections, connections design; bolts, bearing, slip-critical, eccentric shear, welds, capacity, fillets, eccentric welds, stability, frame design; beam-column connections, base plate, bracings, optimization, computer design tools.

**Prerequisite(s):** Grade of C or better in CEIE 311. Prerequisite enforced by registration system.

**Notes:** Credit is not given for both CEIE 412 and 512.

**CEIE 413 - Reinforced Concrete Design**

Credits: 3 (NR)
Covers the analysis and design of reinforced concrete members including beams, columns, slabs and footings; sizing of structural members for flexure, shear and torsion; determining serviceability limits including deflection, shrinkage and creep; detailing reinforcing steel bars including bond, development length and splices; design of an integrated reinforced concrete structure for gravity loads, wind loads and seismic loads in accordance with ACI code requirements.

**Prerequisite(s):** Grade of C or better in CEIE 311. Prerequisite enforced by registration system.

**Notes:** Credit is not given for both CEIE 413 and 513.

**CEIE 431 - Foundation Design**

Credits: 3 (NR)
Introduction to various principles and practices of geotechnical engineering including estimation of soil properties using in-situ tests, laboratory tests, and correlations. Course includes the study of earth pressure theories as applied to the design of retaining walls, anchored bulkheads, and excavation bracing. Additional topics include retaining wall stability, bearing capacity and
settlement of shallow foundations on sands and clays and design considerations and capacity analysis of deep foundations.

**Prerequisite(s):** Grade C or better in CEIE 305 or CEIE 331. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring.

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**CEIE 435 - Introduction to Engineering Geology**

Credits: 3 (NR)  
Introduction to formation and occurrence of earth materials - rock and soil; weathering processes, geomorphology, structural geology, interpreting topographic and geologic maps; field investigation fundamentals, field engineering properties of soil and rock; standards and terminology; rock mass engineering classification systems; subsurface water control; rock as a construction material; special case studies in foundations, such as sinkholes, waste impoundments, dam failures, earth spillway performance.

**Prerequisite(s):** Grade C or better in CEIE 305 or CEIE 331. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall.

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**CEIE 440 - Water Supply and Distribution**

Credits: 3 (NR)  
Analysis and design of public water supplies. Topics include supply evaluation; water quality and quantity requirements; treatment requirements and methods; hydraulic analysis of water distribution systems including line sizing, fire protection, pumps, valves, and storage; sustainability; security; concepts in management, business, and public policy of public water supplies; and federal, state, and local government laws and regulations related to public water systems. Requires laboratory, field work on selected topics.

**Prerequisite(s):** Grade of C or better in CEIE 340. Prerequisite enforced by registration system.

**Notes:** Credit is not given for both CEIE 440 and 540.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

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**CEIE 442 - Open Channel Flow**

Credits: 3 (NR)  
Analysis and design of open channels. Topics include principles of open channel flow including conservation of mass, momentum and energy; flow regimes including uniform, gradually varied, rapidly varied, and unsteady flows; sediment transport; channel design; and modeling and computer applications in open channel analysis and design.

**Prerequisite(s):** Grade of C or better in CEIE 340. Prerequisite enforced by registration system.
Notes: Credit is not given for both CEIE 442 and 542.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

CEIE 450 - Environmental Engineering Systems

Credits: 3 (NR)

Introduces systems analysis in environmental engineering. Applies linear and dynamic programming, computer modeling, and other systems analysis methodologies to solve environmental engineering problems related to air, soil, and water pollution. Reviews experimental design approaches to characterize environmental sites. Designated a Green Leaf Course.

Prerequisite(s): Grade of C or better in CEIE 355. Prerequisite enforced by registration system.

Notes: Credit is not given for both CEIE 450 and CEIE 550.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

CEIE 453 - Water and Wastewater Treatment Processes

Credits: 3 (NR)

The course studies unit treatment processes used in the treatment of water and wastewater systems. Topics include water quality, regulatory requirements, physical unit processes, chemical treatment processes and an introduction to biological treatment processes as applied to a range of community sizes.

Prerequisite(s): Grade of C or better in CEIE 355. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

CEIE 461 - Traffic Engineering

Credits: 3 (NR)

Elements of traffic engineering analysis; system components of traffic operations: driver, vehicle, and roadway; traffic flow design elements including volume, density, and speed; intersection design elements including traffic control device warrants, signal timing, delay, capacity, and accident countermeasures; and terminal design elements including inflow, outflow, and circulation.

Prerequisite(s): Grade of C or better in CEIE 360. Prerequisite enforced by registration system.
Notes: Credit is not given for both CEIE 461 and 561.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

**CEIE 462 - Urban Transportation Planning**

Credits: 3 (NR)
Technical and qualitative aspects of urban transportation planning process. Topics include urban travel characteristics and data collection methods; urban transportation modeling system, including land use, trip generation, trip distribution, mode choice, and trip assignment models; site traffic impact studies; environmental impacts; project and plan evaluation; and technology options for urban transport.

Prerequisite(s): Grade of C or better in CEIE 360. Prerequisite enforced by registration system.

Notes: Credit is not given for both CEIE 462 and CEIE 562.

**CEIE 471 - Construction Administration**

Credits: 3 (NR)
Examines the principals of project planning and administration using modern specification and project delivery methods. The role of the project manager as facilitator, constructability advisor, and on-site administrator is emphasized. Project risk transference, market conditions, and legal requirements are explored in the construction contract environment. Other topics include green specifications, design-build delivery, job order contracting, turnkey construction, and public-private partnerships. Appropriate for students, engineering and design professionals, project managers, contract administrators, and owners interested in the planning and administration needs of construction.

Prerequisite(s): Grade of C or better in CEIE 370 Prerequisite enforced by registration system.

Notes: Credit is not given for both CEIE 471 and CEIE 571.

**CEIE 472 - Building Information Modeling**

Credits: 3 (NR)
Virtual design and construction techniques are covered using modern 3D Building Information Modeling (BIM) software. Historical and technological basis for virtual building and infrastructure design are presented. Design and construction coordination are emphasized using clash detection, conflict management, constructability analysis, specification mapping, and asset management. Industry supported model component databases are used with commercial software design environments for
hands-on simulated design and construction projects.

**Prerequisite(s):** Grade of C or better in CEIE 370. Prerequisite enforced by registration system.

**Notes:** Credit is not given for both CEIE 472 and CEIE 572.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**CEIE 490 - Senior Design Project**

Credits: 3 (NR)  
Capstone design experience. Integrates all design fundamentals employed by a typical civil engineering design team. Major team efforts include land use, transportation, water and sewerage, stormwater, site analysis, economic and regulatory considerations, sectioning, grading, and siting. Students focus on teamwork, interdisciplinary interaction, and tradeoff decision making. Design team analyzes all aspects of a major urban project, develops solutions to design problems, and produces project report and oral presentation. Design effort completed and report is prepared, presented, and evaluated. Primary course goal is to produce design for contemporary civil infrastructure project.

Fulfills general education requirement in synthesis.

**Prerequisite(s):** Senior standing. Grade C or better in CEIE 301, CEIE 311, CEIE 340, CEIE 355, CEIE 360, (CEIE 305 or CEIE 331), CEIE 370, CEIE 400, and two 4xx level technical electives. Grade of S (Satisfactory) in CEIE 404. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**CEIE 498 - Independent Study in Civil Engineering**

Credits: 1-3 (RT)  
Directed self-study of special topics of current interest.

**Prerequisite(s):** Must have completed 60 credits of course work; permission of the Department Chair.

**Notes:** May be repeated for maximum 6 credits if topics are substantially different.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

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**CEIE 499 - Special Topics in Civil Engineering**

Credits: 1-3 (RT)  
Varies with nature of topic. Topics of special interest to undergraduates.
CEIE 500 - Land Development Engineering

Credits: 3 (NR)
Quantitative and qualitative analysis in planning, design, construction, and management of engineering systems and facilities. Introduces policies, programs, and regulations that influence land development, history-enabling legislation, governing and regulating bodies, control of site-plan development, and approval process. Examines structure, function, and purpose of infrastructure systems, and ways in which infrastructure systems design can be achieved.

Prerequisite(s): BS in CEIE or permission of instructor.

Notes: Credit is not given for both CEIE 400 and 500.

CEIE 501 - Sustainable Development

Credits: 3 (NR)
Introduction to sustainability concepts and terminology including the development and use of sustainability indices. Exploration of sustainability tools and frameworks such as the Leadership in Energy and Environmental Design (LEED) Green Building Rating System, American Institute of Architects Sustainable Design Resources Guide, and the Natural Step (TNS) Framework. Methods for evaluation of sustainable sites, water/energy efficiency, sustainable materials and resources, and indoor air quality are presented.
Designated a Green Leaf Course.

Prerequisite(s): Graduate standing.

CEIE 510 - Geographic Information Systems in Engineering

Credits: 3 (NR)
Introduces geographic information systems (GIS) and their application in environmental, transportation, land-use planning, and other engineering-related decision situations. Introduces methods and technologies for spatial data acquisition, specification, storage, manipulation, query, thematic analysis, presentation, and application in the design process. Introduces relationships, integration of GIS with computer-aided design and global positioning system. Hands-on projects.

Prerequisite(s): Knowledge of computer programming and databases or permission of instructor.
Notes: Credit is not given for both CEIE 410 and 510.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall

CEIE 511 - Introduction to Design and Inventive Engineering

Credits: 3 (NR)
Engineering creativity and its roots; DaVinci Principles, the Medici Effect, creative environment, engineering method, AI and evolutionary computation in design, collaborative and Internet-based design; evaluation in design; human problem solving; inventive design methods such as constraint search, morphological analysis, brainstorming, Synectics, and TRIZ. Requires group projects using problems provided by industry.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CEIE 512 - Structural Steel Design

Credits: 3 (NR)
Structural design process, steel material and shapes, steel behavior, specs and codes, LRFD/ASD, loads, gravity and lateral systems, bracings, tributary areas, tension members design; shear lag, net area, load transfer, column design; column strength curve, effective length approach, local buckling, beam design; lateral-torsional buckling, unbraced length, noncompact and compact, deflections, connections design; bolts, bearing, slip-critical, eccentric shear, welds, capacity, fillets, eccentric welds, stability, frame design; beam-column connections, base plate, bracings, optimization, computer design tools

Prerequisite(s): CEIE 311

Notes: Credit is not given for both CEIE 412 and 512.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

CEIE 513 - Reinforced Concrete Design

Credits: 3 (NR)
Covers the analysis and design of reinforced concrete members including beams, columns, slabs and footings; sizing of structural members for flexure, shear and torsion; determining serviceability limits including deflection, shrinkage and creep; detailing reinforcing steel bars including bond, development length and splices; and design of an integrated reinforced concrete structure for gravity loads, wind loads and seismic loads in accordance with the ACI code requirements.

Prerequisite(s): CEIE 311

Notes: Credit is not given for both CEIE 413 and 513.
CEIE 524 - Introduction to Bridge Engineering

Credits: 3 (NR)
A balanced theoretical and practical insight into the art and science of bridge engineering. Various methodologies of bridge design and evaluation are investigated, including constructability reviews. Bridges of steel, reinforced concrete, and pre-stressed concrete materials are included. Short-span composites; major innovation and low cost solutions targeted at aging infrastructure.

Prerequisite(s): Graduate Standing in CEIE; CEIE 512 or CEIE 513 or equivalent.

CEIE 525 - Structural Evaluation and Rehabilitation

Credits: 3 (NR)
Structural condition survey and evaluation for strength and serviceability of existing structures including foundation elements; older building practices and materials; criteria for rehabilitation; retrofit techniques for change in function, loading, and seismic forces. Historic preservation issues. Repair, remediation, and structural strengthening methods and current trends. Carbon fiber external P.T. Material selection criteria, including mechanical and environmental factors. Cost/value feasibility analysis; estimating remedial construction costs; engineering oversight of rehabilitation work.

Prerequisite(s): Graduate Standing in CEIE.

CEIE 526 - Advanced Steel Design

Credits: 3 (NR)
Behavior, strength, and design of vertical steel structures using the LRFD approach; plate girders, composite beams, welded built-up columns, bolted and welded connections, beam-columns, and torsion; introduction to plastic analysis and its application to members and vertical structures; erection procedure and methods field inspection issues; unique properties of high strength steels.

Prerequisite(s): Graduate Standing in CEIE; CEIE 512 or equivalent.
CEIE 527 - Pre-stressed Concrete

Credits: 3 (NR)
Strength, behavior, analysis, and design of pre-stressed concrete members, vertical building structures, and bridges, with emphasis on pre-tensioned, precast construction, and post-tensioned construction; basics of segmental concrete bridges, cable-stayed bridges, and spliced-girder concrete bridges; continuous span theory; protection of pre- & post-tensioned systems; secondary effects. Composite Portland Cement with cast-in-place topping; precast as a stay-in-place system; connection detailing; durability issues; advantages in a marine environment.

Prerequisite(s): Graduate Standing in CEIE; CEIE 513 or equivalent.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Spring

CEIE 531 - Earth Retaining Structures and Slope Stability

Credits: 3 (NR)
Earth pressure theory and limit equilibrium theory used in the design of temporary and permanent earth retaining structures; limit equilibrium slope stability; retaining wall design and associated construction issues of gravity walls, conventional concrete retaining walls, mechanically stabilized walls, braced and tiedback excavation support systems, and soil nailing walls; guidelines for the selection of retention method for permanent and temporary conditions.

Prerequisite(s): Graduate Standing in CEIE;

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CEIE 532 - Foundation Design

Credits: 3 (NR)
Introduction to various principles and practice of geotechnical engineering including estimation of soil properties using in-situ tests, laboratory tests, and correlations. Course includes the study of earth pressure theories as applied to the design of retaining walls, anchored bulkheads, and excavation bracing. Additional topics include retaining wall stability, bearing capacity and settlement of shallow foundations on sands and clays and design considerations for deep foundations.

Prerequisite(s): Graduate Standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring.

CEIE 535 - Engineering Geology
Introduction to formation and occurrence of earth materials - rock and soil; weathering processes, geomorphology, structural geology, interpreting topographic and geologic maps; field investigation fundamentals, field engineering properties of soil and rock; standards and terminology; rock mass engineering classification systems; subsurface water control; rock as a construction material; special case studies in foundations, such as sinkholes, waste impoundments, dam failures, earth spillway performance.

Prerequisite(s): Graduate Standing in CEIE;

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall

CEIE 540 - Water Supply and Distribution

Credits: 3 (NR)

Analysis and design of public water supplies. Topics include supply evaluation; water quality and quantity requirements; treatment requirements and methods; hydraulic analysis of water distribution systems including line sizing, fire protection, pumps, valves, and storage; sustainability; security; concepts in management, business, and public policy of public water systems; and federal, state, and local government laws and regulations related to public water systems. Requires laboratory, field work on selected topics. Designated a Green Leaf Course.

Prerequisite(s): A course in hydraulics or fluid mechanics.

Notes: Credit is not given for both CEIE 440 and 540.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CEIE 542 - Open Channel Flow

Credits: 3 (NR)

Analysis and design of open channels. Topics include principles of open channel flow including conservation of mass, momentum and energy; flow regimes including uniform, gradually varied, rapidly varied, and unsteady flows; sediment transport; channel design; modeling and computer applications in open channel analysis and design.

Prerequisite(s): A course in hydraulics or fluid mechanics.

Notes: Credit is not given for both CEIE 442 and 542.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CEIE 550 - Environmental Engineering Systems
Introduces systems analysis in environmental engineering. Applies linear and dynamic programming, computer modeling, and other systems analysis methodologies to solve environmental engineering problems related to air, soil, and water pollution. Reviews experimental design approaches for the characterization of environmental sites.

**Prerequisite(s):** CEIE 455.

**Notes:** Credit is not given for both CEIE 450 and 550.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

### CEIE 552 - Wastewater Engineering

Credits: 3 (NR)  
Explores design fundamentals to treat wastewater. Topics include environmental regulations; wastewater characterization; pretreatment systems; biological, physical, and chemical treatment; treatment and disposal of wastewater sludge; and financing and management. Includes consequences of environmental policies; environmental impact assessments; and federal, state, and local government laws and regulations related to wastewater collection, treatment, and disposal.

**Prerequisite(s):** CEIE 555.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

### CEIE 553 - Water and Wastewater Treatment Processes

Credits: 3 (NR)  
The course studies unit treatment processes used in the treatment of water and wastewater systems. Topics include water quality, regulatory requirements, physical unit processes, chemical treatment processes and an introduction to biological treatment processes as applied to a range of community sizes.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

### CEIE 555 - Introduction to Environmental Engineering

Credits: 3 (NR)  
Introduces principles of environmental engineering management and design pertaining to water supply and treatment, wastewater treatment, solid waste management, air pollution control, noise pollution measurement and control, and environmental impact assessment.

**Notes:** Credit is not given for both CEIE 355 and 555.
CEIE 556 - Environmental Law

Credits: 3 (NR)
Introductory course in the study of environmental laws as they pertain to urban systems infrastructure management. Reviews the National Environmental Policy Act, Clean Air Act, Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation, and Liability Act, and other environmentally related legislation. Also reviews laws for allocation of surface and groundwater supplies, and reviews environmental law databases.

Notes: Credit is not given for both CEIE 456 and 556.

CEIE 560 - Public Transportation Systems

Credits: 3 (NR)
Analyzes public transportation systems in terms of their role in urban transportation. Topics include history of public transportation in the United States, quantitative performance attributes of different modes, analytical techniques for planning and operation, and management and administrative concepts.

Prerequisite(s): CEIE 360.

Notes: Credit is not given for both CEIE 460 and 560.

CEIE 561 - Traffic Engineering

Credits: 3 (NR)
Covers elements of traffic engineering analysis; system components of traffic operations: driver, vehicle, and roadway; traffic flow design elements including volume, density, and speed; intersection design elements including traffic control device warrants, signal timing, delay, capacity, and accident countermeasures; and terminal design elements including inflow, outflow, and circulation.

Prerequisite(s): CEIE 365.

Notes: Credit is not given for both CEIE 461 and 561.

Hours of Lecture or Seminar per week: 1-6
CEIE 562 - Urban Transportation Planning

Credits: 3 (NR)
Covers technical and qualitative aspects of urban transportation planning process. Topics include urban travel characteristics and data collection methods; urban transportation modeling system, including land use, trip generation and distribution, mode choice, and trip assignment models; site traffic impact studies; environmental impacts; project and plan evaluation; and technology options for urban transport.

Prerequisite(s): CEIE 365.

Notes: Credit is not given for both CEIE 462 and 562.

CEIE 565 - Design of Transport Systems

Credits: 3 (NR)
Covers street and highway facilities design emphasizing interaction among driver, vehicle, and geometric design elements. Design of interchanges and intersections; highway roadside safety and tort liability; pavement design, maintenance and safety; edge drop-off; clear zone concept; roadside barriers; guideway treatments; traffic calming; pedestrian and bicycle and transit design challenges; and work-zone traffic control. Provides skills to understand interaction among driver, vehicle, and environment, and how to incorporate better design practices. Also introduces concepts of forgiving highway design and highway tort liability.

Prerequisite(s): CEIE 360.

Notes: Credit is not given for both CEIE 471 and 571.

CEIE 571 - Construction Administration

Credits: 3 (NR)
Examines the principals of project planning and administration using modern specification and project delivery techniques. The role of the project manager as facilitator, constructability advisor, and on-site administrator is emphasized. Project risk transference, market conditions, and legal requirements are explored in the construction contract environment. Other topics include green specifications, design-build delivery, job order contracting, turnkey construction, and public-private partnerships. Appropriate for students, engineering and design professionals, project managers, contract administrators, and owners interested in the planning and administration needs of construction.

Notes: Credit is not given for both CEIE 471 and 571.
CEIE 572 - Building Information Modeling

Credits: 3 (NR)
Virtual design and construction techniques are covered using modern 3D Building Information Modeling (BIM) software. Historical and technological basis for virtual building and infrastructure design are presented. Design and construction coordination are emphasized using clash detection, conflict management, constructability analysis, specification mapping, and asset management. Industry-supported model component databases are used with commercial software design environments for hands-on simulated design and construction projects.

Notes: Credit is not given for both CEIE 472 and 572.

CEIE 573 - Legal Aspects of the Construction Process

Credits: 3 (NR)
Examines the legal principles associated with the construction process. Introduces legal and project delivery concepts and review of the rights and responsibilities of construction project participants. Topics include the application of differing site conditions clauses, delay claims, termination rights, remedies for breach of contract, and dispute resolution techniques. Also includes review of industry legal issues, such as principles of risk management, LEED liability, and design-build contracts.

Prerequisite(s): Graduate Standing in CEIE.

CEIE 575 - Design for Constructability

Credits: 3 (NR)
Systems design of structures to consider foundations, structures and constructability; foundation alternatives; structural design to simplify erection; prefabrication, modulation of structures; material handling on a construction site; crane selection and placement; temporary works.

Prerequisite(s): Graduate Standing in CEIE.

CEIE 576 - Construction Cost Estimating
Overview of cost estimating and financial management in the modern construction industry. Techniques and software applications for construction take-offs, bidding, bonding, insurance, equipment ownership, material and labor costing. Additional topics include: cost recovery planning; budgeting, forecasting, acquisition, cash flow management, managerial accounting concepts, and taxes.

**Prerequisite(s):** Graduate Standing in CEIE.

**Hours of Lecture or Seminar per week:** 1
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall

### CEIE 580 - Risk and Reliability in Civil Engineering Practice

Credits: 3 (NR)
Practice Engineering hazard assessment; definition of risk, reliability and uncertainty; risk identification; risk analysis concepts and models; probability in risk assessment; failure analysis; consequence analysis, risk benefit assessment; reliability-based designs; uncertainty analysis; risk communication; risk-based decision-making; risk assessment in public policy.

**Prerequisite(s):** Graduate Standing in CEIE;

**Hours of Lecture or Seminar per week:** 1-6
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall

### CEIE 600 - Civil Engineering Infrastructure Planning and Management

Credits: 3 (NR)
Study of planning and management practices applicable to the life cycle of the physical urban infrastructure including roads, sewers, water distribution and other pipelines, telecommunications, and energy distribution systems. Includes study of relationship of urban growth and infrastructure reinvestment; mechanisms of deterioration; direct and indirect methods of assessment and degradation models; capital finance, budgeting, and programming; planning integration and coordination; quantitative applications in planning; uncertainty and reliability; public-private partnerships; operation and maintenance strategies; and future issues.

**Hours of Lecture or Seminar per week:** 1-12
**Hours of Lab or Studio per week:** 0

### CEIE 601 - Infrastructure Modeling

Credits: 3 (NR)
Concepts of modeling for infrastructure engineering. Covers modeling, simulation, optimization, deterministic and stochastic models, and limitations of modeling approaches. Also includes multiple objective, multiple decision-maker problems, and case studies in areas such as transportation, water resources, the environment, energy, telecommunications, and construction.

**Prerequisite(s):** CEIE 605
CEIE 605 - Infrastructure Systems Analysis

Credits: 3 (NR)
Probability and statistics topics for analysis of infrastructure systems. Includes Bayesian decision theory, decision trees, Monte Carlo analysis, stochastic models, and economic analysis of infrastructure projects and systems.

Prerequisite(s): STAT 344.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall

CEIE 621 - Applied Finite Element Methods

Credits: 3 (NR)
Introduces the theory, applications, and software of the Finite Element (FE) method to common structural and geotechnical engineering problems. Focuses on FE modeling including 1-D, 2-D, and 3-D and other special element types, loads and boundary conditions, interpreting results, and using engineering judgment and troubleshooting to verify analysis results. Covers linear and nonlinear FE modeling and analysis of reinforced concrete structures, soil-structure interaction, and construction phases.

Prerequisite(s): Graduate Standing in CEIE.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall

CEIE 633 - Advanced Foundation Design and Ground Improvement

Credits: 3 (NR)
Design of foundations for civil engineering structures, including settlement and bearing capacity. Foundation types to include shallow foundations, spread footings, mats, deep foundations (driven piles, bored piles and drilled shafts subjected to axial and lateral loading) - single and group action. Machine foundations for rotating equipment. Ground improvement including grouting, deep soil mixing, stone columns, special compaction techniques, lightweight fill; wick drains.

Prerequisite(s): Graduate Standing in CEIE;

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

CEIE 634 - Groundwater and Geoenvironmental Design
Equations of groundwater flow and seepage, groundwater site investigations, parameter determination, flownets, well design and aquifer testing, design of dewatering systems, seepage control. Conservative and non-conservative pollutant transport in groundwater, transport processes, modeling techniques for flow and transport. Groundwater remediation technologies, Brownfields and land revitalization.

Prerequisite(s): Graduate Standing in CEIE;

Hours of Lecture or Seminar per week: 1 - 3
Hours of Lab or Studio per week: 0
When Offered: Spring

CEIE 636 - Sources of Geotechnical Data

Credits: 3 (NR)
Resources for conducting desk top studies; tools for field investigations; subsurface investigations (options and selection of techniques); laboratory testing of soil and rock; accepted testing procedures; typical values; empirical relationships between properties and testing techniques; risk and uncertainty; use of lab testing, insitu strength testing, and empirical methods in design; identifying slickenslides.

Prerequisite(s): Graduate Standing in CEIE.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

CEIE 641 - Water Resources Engineering I: Principles and Practice

Credits: 3 (NR)
Introduction to the principles of hydrology and hydraulics, and their application to the planning, design and management of modern water resources.

Equivalent to CEIE 631 (2011-2011 Catalog)

Prerequisite(s): Graduate standing in CEIE; CEIE 340 or equivalent.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall

CEIE 644 - Groundwater Systems Modeling

Credits: 3 (NR)
Introduces groundwater hydrology and modeling, including quantity and quality aspects. Topics include characterization of subsurface regime; well hydraulics; consideration of two-dimensional steady and unsteady-state flows; exploration of modeling approaches; simulation and optimization modeling; contaminant transport; parameter estimation; and design of systems to control groundwater quantity and quality.
Equivalent to CEIE 632 (2011-2012 Catalog)

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CEIE 657 - Environmental Engineering Microbiology

Credits: 3 (NR)
This course addresses the fundamental aspects of microbial physiology and ecology and their application to environmental engineering processes. Specific topics include cell structure and function, energetics, metabolism, enzyme and growth kinetics, microbial/environmental interactions (e.g. interactions with organic pollutants), biogeochemical cycles, and an introduction to engineering applications including bioremediation, wastewater treatment, biosensors and microbial fuel cells.

Prerequisite(s): Graduate Standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

CEIE 663 - Intelligent Transportation Systems

Credits: 3 (NR)
Advanced transportation system operations and safety through the use of wireless and wireline communications; integrated transportation systems; in-vehicle technologies; industry standards; and systems architecture. Provides skills to apply advanced technologies to transportation systems to improve operational and safety performance. Provides nontraditional tools to address issues of congestion and improved safety performance.

Prerequisite(s): CEIE 561 or 562.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CEIE 671 - Best Engineering Management Practices

Credits: 3 (NR)
Covers strategies to identify and implement best engineering management practices. Addresses development of performance standards. Introduces quality improvement methods and standards, including Quality Functional Development, ISO 9000, Baldrige Excellence Award, and the Six Sigma method. Presents relevant national and engineered standards, statistical norms, rules of thumb, selected statistics from comparative projects, excerpts from performance records, and performance targets. Covers case studies relating to management of infrastructure projects. Includes introduction to benchmarking methods, addressing criteria to select benchmarking program or process.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0
CEIE 673 - Leading Engineering Innovation

Credits: 3 (NR)
Strategies for fostering and assessing the innovative spirit of a professional, technical organization will be covered. Basic engineering leadership concepts, theories, and principles will be reviewed. Relevant case studies describe the discipline of fostering and leading technical innovation in existing technical organizations; and how technology and other competitive developments are radically changing the process of engineering innovation.

Prerequisite(s): Graduate standing

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CEIE 674 - Infrastructure Finance

Credits: 3 (NR)
Course reviews key financial concepts used in the management of municipal infrastructure using a case study approach. Issues related to both public and private infrastructure entities will be covered. The course provides a practical introduction to a broad spectrum of infrastructure finance issues.

Prerequisite(s): Graduate standing

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CEIE 675 - Developing the Technical Enterprise

Credits: 3 (NR)
Introduce students to concepts of engineering enterprise development as related to technical products and services. Engineering students learn to think and act entrepreneurially, the importance of enterprise goals, and how to develop technical opportunities.

Prerequisite(s): Graduate standing

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CEIE 680 - Introduction to Infrastructure and Security Engineering

Credits: 3 (NR)
In-depth review of present and proposed practices and issues to manage civil infrastructure, focusing on performance and security through the full life cycle, including planning, designing, and construction of new, rehabilitated, modified, and recycled or decommissioned components. Covers asset-management methods and their effectiveness in managing all types of risk. Profiles policies leading civil infrastructure industry toward adoption of such methods, and examines industry case studies. Special attention to vulnerability assessment and risk management in context of broad sampling of potential threats.
Prerequisite(s): BS in civil engineering, or permission of instructor.

Hours of Lecture or Seminar per week: 1 - 6
Hours of Lab or Studio per week: 0

CEIE 681 - Security of Structural Systems

Credits: 3 (NR)
Basic concepts of security of structural systems; analytical models of behavior of structural systems under various security threats; computer simulation of security threats, including blasts and fire; generation of terrorist scenarios and of preventive structural measures; design for security; out-of-the-box approaches to development of preventive structural measures; lessons learned; and intelligent structural security systems.

Prerequisite(s): BS in Civil Engineering or CEIE 367.

Hours of Lecture or Seminar per week: 1-9
Hours of Lab or Studio per week: 0

CEIE 683 - Water and Wastewater Systems Security

Credits: 3 (NR)
Examines overall security of water and wastewater systems. Covers theory and methods to define water and wastewater infrastructure as physical and organizational systems. Explores concepts of infrastructure systems security; identifies actors, interactions in organizational infrastructure, and threats to water and wastewater infrastructure; describes behavior of physical and organizational infrastructures under stress; examines history of threats or attacks against water and wastewater systems; and explores evolution of design, operations, and maintenance paradigms in response to changes in threats. Covers proactive responses to security threats through vulnerability assessments, and models of organizational and physical infrastructure system.

Prerequisite(s): BS in Civil Engineering or CEIE 440 and CEIE 455.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CEIE 685 - Civil Engineering Information Management

Credits: 3 (NR)
Advanced course covering all phases of information management life cycle from conceptual design and data collection through systems development, archiving, and disposal. Covers software engineering such as structured analysis, rapid prototyping, and object-oriented analysis as applied to urban systems infrastructure problem solving. Reviews database technology, spreadsheets, communications software, customized applications software, groupware, and graphics software including computer-aided design and geographic information systems. Covers selection and use of appropriate software to match specific engineering problems related to the design, construction, and management of civil engineering infrastructure. Includes design and development of system for engineering application.

Hours of Lecture or Seminar per week: 1-9
**CEIE 686 - Transportation System Security and Safety**

Credits: 3 (NR)
Focuses on critical transportation systems infrastructure and operations, and technologies for predicting and managing damage and disruptions caused by potential threats, including natural and technological disasters and terrorist threats. Includes asset management, methodologies for assessing vulnerabilities, potential impact of damage and disruption, applying state-of-the-art technologies and R&D processes for harnessing best analysis methods, and technologies for hardening transportation infrastructure systems. Includes sensing and surveillance using satellite and aerial remote sensing imagery, application of GIS and spatial information technologies, information and communication, intelligent transportation systems, hardening systems, and making intelligent choices for implementing technology advances to transportation security and safety.

**Prerequisite(s):** BS in engineering or permission of instructor.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0

**CEIE 690 - Topics in Civil Engineering**

Credits: 3 (RT)
Topics not covered in the regular civil engineering offerings.

**Prerequisite(s):** Determined by topic.

**Notes:** Course content may vary each semester. Course may be repeated with change in topic.

**Hours of Lecture or Seminar per week:** 1-6
**Hours of Lab or Studio per week:** 0

**CEIE 742 - Water Resources Engineering II: Water Resource Systems**

Credits: 3 (NR)
Introduces concepts, applications, and tools of systems analysis for water resources planning, management, and design. Problems including river basin planning, real-time hydrosystem operations, water quality management, capacity expansion, urban drainage network design, and sanitary sewer design used to illustrate applications of systems analysis. Tools include optimization and simulation modeling, and knowledge-based systems.

Equivalent to CEIE 732 (2011-2011 Catalog)

**Prerequisite(s):** Graduate Standing in CEIE; CEIE641 or equivalent.

**Hours of Lecture or Seminar per week:** 1-6
**Hours of Lab or Studio per week:** 0
CEIE 751 - Environmental Sustainability and Entrepreneurship

Credits: 3 (NR)

Intended to help students develop innovative and sustainable ideas that satisfy social, environmental, and financial goals. Appropriate for students with a background in environmental engineering with interest in technical business practice that demonstrates social responsibility and environmental stewardship. Students develop concepts for green products and services and learn to: develop new green/sustainable ideas, estimate the market audience and impact of the concept, and estimate the costs of development and impacts on the environment.

Designated a Green Leaf Course.

Prerequisite(s): Graduate Standing in CEIE

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
When Offered: Spring

CEIE 762 - Transportation System Planning Models

Credits: 3 (NR)

Covers transportation systems analysis; theory, mathematical structure, and applications of transportation planning models; network analysis and equilibrium; dynamic and stochastic equilibrium models; modal choice analysis; discrete choice models of transportation demand; and model estimation and aggregation.

Prerequisite(s): CEIE 562 or 660; CEIE 601.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CEIE 767 - Traffic Engineering Modeling and Analysis

Credits: 3 (NR)

Covers basic principles of simulation; queueing theory and traffic signal operations at individual intersections, arterials and networks; applying models related to traffic signalization; optimization and traffic simulation; and developing skills to select most appropriate model for given scenario.

Prerequisite(s): CEIE 561.

Corequisite(s): CEIE 601.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

CEIE 777 - Analytical Methods for Construction Operations
Overview of quantitative methods used for the design and analysis of construction operations to maximize productivity and minimize resource idleness. Includes discussions on equipment productivity, queuing theory, line of balance techniques, simulation, and applications to lean construction.

**Prerequisite(s):** Graduate Standing in CEIE; CEIE 605, STAT 544 or equivalent.

**CEIE 795 - Civil and Infrastructure Engineering Seminar**

Credits: 0 (RD)  
Invited speakers, faculty, and CEIE graduate students lecture on current topics and research. Partially fulfills MS in civil and infrastructure engineering seminar requirement; required for master's candidates during semester they complete research project or thesis.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit.

**CEIE 796 - Directed Reading**

Credits: 1-3 (RD)  
Reading on specific topic under direction of faculty member.

**Prerequisite(s):** Graduate standing and permission of instructor.

**Notes:** May be repeated with change in topic.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

**CEIE 798 - Research Project in Civil Engineering**

Credits: 3 (NR)  
Analyzes and investigates contemporary problem in civil, environmental, and infrastructure engineering. Requires prior approval by faculty member who supervises student's work.

**Prerequisite(s):** Permission of instructor

**Corequisite(s):** CEIE 795.

**Notes:** Written report also required.
CEIE 799 - Master's Thesis

Credits: 1-6 (RD)
Research project chosen and completed under guidance of graduate faculty member that results in technical report acceptable to three-faculty-member committee, and an oral defense.

Prerequisite(s): 18 credits of graduate-level course work and permission of instructor.

Hours of Lecture or Seminar per week: 1-21
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

CEIE 800 - Civil, Environmental, and Infrastructure Engineering Colloquium

Credits: 1 (RD)
Semester long themed series, required of Civil and Infrastructure PhD students. Features variety of speakers from universities, government, and private sectors. Topics include civil engineering technologies, research advancements, and policies. Doctoral students required to take 2 credits of CEIE 800 to fulfill degree requirements. No more than 1 credit per semester may be taken. Students eligible to register upon successful completion of qualifying exams.

Prerequisite(s): Graduate Standing

Notes: Students must complete ten written critiques of seminars over the course of two credits of CEIE 800. Students must present their dissertation work once a semester when registered in CEIE 800.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CEIE 890 - Special Topics in Urban Transportation

Credits: 3 (RD)
Includes traffic safety analysis, simulation in transportation, intelligent transportation systems, advanced public transportation systems, congestion and travel demand management, geographic information systems and information technology, and innovative refinancing and public-private partnerships.

Prerequisite(s): CEIE 560 and 660 or equivalent; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
CEIE 892 - Special Topics in Environmental and Water Resource Systems Engineering

Credits: 3 (RD)

Possible topics include studies in waste minimization; pollution prevention; hazardous waste management; wastewater management; air pollution control; solid waste management; environmental decision making; sustainability; water resource and environmental economics; wetlands management, design and construction; groundwater contamination modeling; stochastic hydrology; river basin planning and management; and water quality modeling. Designated a Green Leaf Course.

Prerequisite(s): CEIE 601

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

CEIE 894 - Design and Inventive Engineering

Credits: 3 (NR)
Topics include Fundamentals: successful intelligence and creative intelligence, creative class, the Medici Effect, the Renaissance Man and Da Vinci's Seven Principles, engineering creativity; Design Engineering: system designing and architecting, designing as search, evolutionary designing, constraint search, constructive induction, Axiomatic and Inferential Design Theories; Inventive Engineering: Brainstorming, Synectics, Morphological Analysis, TRIZ, Visual Thinking, Inventive Design in Practice; Project Presentations.

Prerequisite(s): Graduate Status

Notes: It is a transdisciplinary course focused on creativity in engineering and science and it is open to all graduate students in the Volgenau School of IT and Engineering, graduate students from other schools are encouraged to register with the instructor’s permission.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

CEIE 896 - Civil Engineering Research Topics

Credits: 3 (RD)
Reading on specific topic under direction of faculty member. May be repeated with change in topic.

Prerequisite(s): Admission into CEIE PhD program, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
CEIE 990 - Civil and Infrastructure Dissertation Topic Presentation

Credits: 1 (NR)
Opportunity for PhD students to present research proposal for critique. Covers presentation of research topic for PhD in Civil and Infrastructure Engineering. Students complete dissertation research proposal. May be repeated with change in topic, but degree credit is given only once.

Prerequisite(s): Graduate Standing; completion of all course work required for PhD in Civil and Infrastructure Engineering or permission of instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CEIE 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Work on research proposal that forms basis for doctoral dissertation. May be repeated for credit.

Notes: No more than 24 credits of CEIE 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
Grading: Satisfactory/No credit only

CEIE 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Formal record of commitment to doctoral dissertation research under direction of faculty member in civil engineering and infrastructure engineering.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
Grading: Satisfactory/No credit only

Classical Studies (CLAS)

Offered by the College of Humanities and Social Sciences

CLAS 240 - Greek and Latin Elements in English
Cred its: 3 (NR)
Studies formation of English vocabulary derived from Greek and Latin prefixes, stems, and suffixes to increase word power in English (vocabulary, style). Special emphasis on bioscientific, medical, and legal terminology. Intended for native and non-native speakers of English. Literary texts illustrate word analyses, vocabulary uses.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLAS 250 - Classical Mythology

Credits: 3 (NR)
Illustrates role of classical myths in classical and modern literature and art.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Course work in English.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLAS 260 - The Legacy of Greece and Rome

Credits: 3 (NR)
Introduces history, culture, and literature of Greece and Rome through close readings of central passages from classical literature dealing with some of the most important aspects of human existence. Illustrates importance of classical antiquity for the Western tradition.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Course work in English.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLAS 340 - Greek and Roman Epic

Credits: 3 (NR)
Examines development of classical epic as genre, from beginnings with Homer to transformations in the works of later Greek and Roman authors.

Fulfills general education requirement in literature.
Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Course work in English.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLAS 350 - Greek and Roman Tragedy

Credits: 3 (NR)
Follows development of tragedy from its origins to the works of Aeschylus, Sophocles, and Euripides, and its reappearance in the Roman world in the tragedies of Seneca. Considers influence of Greek tragedy on later cultures.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Course work in English.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLAS 360 - Greek and Roman Comedy

Credits: 3 (NR)
Studies forms, contexts, and developments of comedy as a dramatic form in Greco-Roman world. Traces development of New Comedy in Hellenistic age, and translation and adaptation of New Comedy by Roman dramatists Plautus and Terence.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Course work in English.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLAS 370 - Greek and Roman Historians

Credits: 3 (NR)
Examines writings of major Greek and Roman historians, including Herodotus, Thucydides, Sallust, Livy, and Tacitus; their interpretations of the past; and their influence.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Course work in English.
CLAS 380 - Greek and Roman Novels

Credits: 3 (NR)
Examines novels written in antiquity, and influences on postclassical and modern literature. Emphasizes works of Longus, Heliodorus, Petronius, and Apuleius.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Course work in English.

CLAS 390 - Topics in Classical Literature and Culture

Credits: 3 (RD)
Studies forms, contexts, and developments of distinctive literary genre or cultural phenomenon in the Greco-Roman world.

Prerequisite(s): ENGL 101/ENGH 101 (or equivalent) or permission of instructor.

Notes: May be repeated for credit when topic is different.

CLAS 499 - Senior Seminar in Classical Studies

Credits: 3 (NR)
Individual research on specialized topic culminating in seminar paper. Fulfills writing-intensive requirement. Subject of seminar determined by instructor in consultation with student.

Prerequisite(s): Classical studies minors, 90 credits including 15 credits in classics, and permission of instructor.

Notes: Permission must be obtained in advance. Students may present no more than 3 credits for graduation.

Climate (CLIM)
Offered by the College of Science

CLIM 101 - Global Warming: Weather, Climate, and Society

Credits: 3 (NR)
This course provides a survey of the scientific and societal issues associated with weather and climate variability and change. The course will examine physical phenomena observed in the Earth's weather and climate, providing sufficient scientific and technical background to enable students to critically examine arguments being discussed by policymakers and the public at large. The course will also review the current debate on climate change from a scientific point of view, with a focus on those aspects that have the largest potential impact on global society.

Fulfills general education requirement in natural science (nonlab).

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLIM 111 - Introduction to the Fundamentals of Atmospheric Science

Credits: 3 (NR)
An overview of the Earth's atmosphere, its history, and the physical and chemical process that determine its characteristics. The focus is on key concepts from thermodynamics, radiation, chemistry, and dynamics that are essential for understanding the state, variability, and long term evolution of the atmosphere, especially in the context of comparisons with other planetary atmospheres.

Fulfills general education requirement in natural science (lab).

Equivalent to PHYS 111

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLIM 112 - Introduction to the Fundamentals of Atmospheric Science Lab

Credits: 1 (NR)
Laboratory course associated with CLIM 111. Study of the Earth's atmosphere based on concepts taken from thermodynamics, radiation transport, chemistry, and dynamics.

Fulfills general education requirement in natural science (lab).

Equivalent to PHYS 112

Corequisite(s): CLIM 111

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1
CLIM 301 - Weather Analysis and Prediction

Credits: 4 (NR)
Large-scale behavior of mid-latitude weather systems. Includes coupling of synoptic motion to mesoscale processes that lead to significant weather events. Introduces the observational network, numerical weather models, and prediction. Laboratory portion gives practical experience in weather analysis, prediction, and technology currently used for visualization and analysis.

Prerequisite(s): MATH 113 or equivalent; one of CLIM/PHYS 111/112 or EOS 121 or GGS 121.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

CLIM 314 - Severe and Extreme Weather

Credits: 3 (NR)
Behavior of weather events ranging from small scale (e.g., thunderstorms and tornadoes) to mesoscale (e.g., fronts and hurricanes). Introduces the dynamical and physical processes, atmospheric boundary layer processes, and coupling between different spatial scales that create and shape severe and localized weather events.

Equivalent to GGS 314

Prerequisite(s): MATH 113 or equivalent; CLIM/PHYS 111/112 or GGS 121.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLIM 390 - Topics in Climate Research

Credits: 1-4 (RD)
Selected topics not covered in fixed content courses. May be included for credit by AOES majors in the 45 credits of courses required for BS degree.

Prerequisite(s): 15 credits of AOES courses within concentration.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 1-6

CLIM 408 - Senior Research

Credits: 3 (RD)
Independent research under guidance of faculty member on a research project in numerical, experimental, observational, or theoretical atmospheric or climate-related research. A written report on the project is required.

Prerequisite(s): 15 credits of AOES courses within major.

Notes: May be taken twice with department permission.
CLIM 409 - Research Internship

Credits: 3 (RD)
On-the-job experience for AOES majors in industry or government laboratories, including summer research programs. Students work in observational, experimental, or theoretical research, and prepare a written report at the end of the internship.

Prerequisite(s): 75 credits. 15 credits of courses in major and permission of department. See department for requirements and application procedure prior to enrollment.

Notes: May be taken twice with department permission.

CLIM 411 - Introduction to Atmospheric Dynamics

Credits: 3 (NR)
The course covers the basic conservation laws of mass, momentum, and energy, and a scaling analysis of the equation of motion and the thermodynamic equation; concepts of circulation and vorticity, balanced flows in the atmosphere (e.g., the geostrophic wind and its vertical shear, and the thermal wind relationship), planetary waves and wave-mean flow interaction. It also covers the baroclinic instability theory and energy transfer in the life cycle of the baroclinic eddies, and two-layer quasi-geostrophic theory for the mid-latitude atmospheric general circulation. Hadley circulation dynamics may be discussed if time permits.

Prerequisite(s): PHYS 260, PHYS 261, MATH 214, MATH 313.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

CLIM 412 - Physical Oceanography

Credits: 3 (NR)
Course describes the global patterns of temperature, salinity, currents and waves in the world’s oceans, and how these patterns influence marine biota, climate, and human activity. Course introduces key concepts which explain physical features of the ocean ranging from microscopic turbulence to global circulation.

Equivalent to GEOL 412.

Prerequisite(s): MATH 113 or MATH 115, and PHYS 160 or PHYS 243, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**CLIM 438 - Atmospheric Chemistry**

Credits: 3 (NR)
The fundamental chemical processes of the Earth's atmosphere including chemical cycles, thermodynamics, reaction kinetics, photochemistry, radiative balance, ozone chemistry and environmental issues, including air pollution, acid rain and global change. Includes some review of extraterrestrial atmospheric chemistry.

Equivalent to CHEM 438

Prerequisite(s): CHEM 331 and 332 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CLIM 690 - Scientific Basis of Climate Change**

Credits: 3 (NR)
A rigorous treatment of global warming, especially with regard to anthropogenic causes, based on the IPCC 4th Assessment Report "The Physical Science Basis". Topics include 1) Overview of observed climate, 2) Variability of climate, 3) Modeling of climate response to green house gas forcing, 4) Green house gases, chemistry, and aerosols, and 5) Projections of climate change and its societal impact.

Prerequisite(s): BS or MS in a natural science or engineering, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CLIM 710 - Introduction to Physical Climate System**

Credits: 3 (NR)
Provides modern understanding of ocean, atmosphere, and land based on fundamental physical laws. Describes current climate and physical processes by which climate is maintained. Covers theoretical models of general circulation of atmosphere, including time mean and transient behavior. Describes basics of ocean circulation, and interactions between ocean and atmosphere. Reviews past climate change; stratosphere and its interactions with troposphere; and role of land processes in modulating climate.

Prerequisite(s): BS or MS in mathematics or a physical science, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CLIM 711 - Introduction to Atmospheric Dynamics**

Credits: 3 (NR)
Covers basic conservation laws of mass, momentum, and energy; and scaling analysis of equation of motion and thermodynamic
equation. Discusses balanced flows in atmosphere, such as geostrophic wind and its vertical shear, and thermal wind relationship. Also explores circulation and vorticity; role of atmospheric boundary layer in mass, momentum, and energy transfer; synoptic scale motions; and role of gravity and Rossby waves in controlling general circulation of atmosphere.

Equivalent to PHYS 676

Prerequisite(s): BS or MS in mathematics or a physical science, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLIM 712 - Physical and Dynamical Oceanography

Credits: 3 (NR)
Introduces climatology and dynamics of oceans. Covers nature of seawater, heat, and salt budgets; general circulation of the ocean, including the Gulf Stream and thermohaline circulations; dynamics of wind-driven ocean circulation; and processes influencing biological and chemical behavior.

Prerequisite(s): CSI 751 or CLIM 710 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLIM 713 - Atmosphere-Ocean Interactions

Credits: 3 (NR)
Provides comprehensive observational and mechanistic understanding of El Niño and Southern Oscillation (ENSO) phenomena. Topics include observations and theories of seasonal and interannual changes in ocean circulation and temperature and interactions with atmosphere; equations of motion and theories of wind-driven circulation; mixed layer observations and theories; midlatitude and equatorial ocean waves; interannual variability and atmosphere-ocean coupling; and tropical oceanography and meteorology.

Prerequisite(s): CLIM 712 or 711 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CLIM 714 - Land-Climate Interactions

Credits: 3 (NR)
Interdisciplinary course providing detailed description of surface energy and water balance over land, and radiative and turbulent transfer. Introduces numerical techniques for modeling land surface and applications in weather, climate, and hydrologic forecasting and simulation. Includes hands-on experience with land surface models in computer laboratory, including sensitivity experiments to reinforce theoretical concepts. Exposure to contemporary research through reading and reviewing seminal journal papers.

Prerequisite(s): BS or MS in mathematics or physical science, or permission of instructor.
CLIM 715 - Numerical Methods for Climate Modeling

Credits: 3 (NR)
Foundation and theory of computational methods for atmosphere and ocean modeling, with special emphasis on finite-difference and spectral methods. Topics include accuracy, consistency, convergence and stability; time stepping schemes; nonlinear computational stability; energy and enstrophy conserving schemes for momentum equations; staggered and curvilinear grids; alternate vertical coordinate systems; implicit and split-explicit barotropic mode solution; pressure gradient errors and vorticity constraints; spectral methods for atmospheric models; and treatment of model physics.

Prerequisite(s): CLIM 712 or 711 or equivalent, or permission of instructor.

CLIM 750 - Geophysical Fluid Dynamics

Credits: 3 (NR)
Introduces geophysical fluid dynamics, the study of rotating stratified flows. Covers hydrostatics; equations of motion, gravity wave dynamics, and stratified flow; effects of rotation, midlatitude dynamics, Rossby number and quasigeostrophic expansion; beta plane approximation; and equatorial Kelvin and Rossby waves.

Prerequisite(s): CLIM 711, or permission of instructor.

CLIM 751 - Predictability of Weather and Climate

Credits: 3 (NR)
Covers fundamental aspects of weather and climate predictability. Using simple dynamical models, illustrates basic theorems on divergence of trajectories in phase space and fundamental periodicity properties of flow. Explores paradigms of turbulence, barotropic and baroclinic instability, and optimal linear growth to describe fundamental error growth mechanisms. Examines examples from real weather forecasting systems. Studies predictability of time averages with simple dynamical models and experiments using complex general circulation models and historical data analysis. Emphasizes roles of boundary conditions of sea surface temperature and soil moisture.

Prerequisite(s): CLIM 711 or equivalent, or permission of instructor.
CLIM 752 - Ocean General Circulation

Credits: 3 (NR)  
Description and theory of large-scale ocean circulation and how it affects climate. Focus is on ubiquitous flow structures such as gyres, equatorial currents, and meridional overturning cells. The class examines how the circulation follows from wind and thermohaline forcing, as well as physical principles. The influence of the circulation on heat transport and climate variability is also discussed. Conceptual guideposts include barotropic gyres, Ekman cells, potential vorticity, western intensification, the interplay of gravity and the Earth’s rotation, advective-diffusive balance, multiple flow states, and Rossby waves.

Prerequisite(s): CLIM 712 or 711 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

CLIM 753 - General Circulation of the Atmosphere

Credits: 3 (NR)  
Overview and several theoretical perspectives of atmospheric transport of energy, moisture, and angular momentum, and how these processes fundamentally affect the climate on various time scales.

Prerequisite(s): CLIM 710 and 711.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

CLIM 759 - Topics in Climate Dynamics

Credits: 3 (RT)  
Covers selected topics in climate dynamics not covered in fixed-content courses.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit when offered with different content.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

CLIM 762 - Statistical Methods in Climate Research

Credits: 3 (NR)  
Introduction to a core set of statistical methods that have proven useful to modern climate and predictability research. Topics include detecting and attributing climate change, describing climate variability with empirical orthogonal functions, statistical forecasting with regression and time series models, and identifying coupled patterns of variability with canonical correlation analysis.

Prerequisite(s): Undergraduate-level linear algebra and STAT 344 (or equivalent), or permission of instructor.
CLIM 763 - Advanced Statistical Methods in Climate Research

Credits: 3 (NR)
Introduction to multivariate statistical techniques commonly used in climate science, with special emphasis on estimation in large dimensional spaces. Topics include: multivariate regression, canonical correlation analysis, predictable component analysis, field significance tests, data assimilation (especially the ensemble Kalman Filter), discriminant analysis, and multivariate detection and attribution of climate change.

Prerequisite(s): CLIM 762 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring.

CLIM 796 - Directed Reading and Research

Credits: 1-6 (RT)
Reading and research on a specific topic in climate dynamics under the direction of a faculty member.

Prerequisite(s): Admission into climate dynamics doctoral program and permission of instructor.

Notes: May be repeated as necessary.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CLIM 991 - Climate Dynamics Seminar

Credits: 1 (RD)
Presentations in climate dynamics field by Mason faculty and invited speakers.

Prerequisite(s): Graduate standing.

Notes: May be repeated for credit; however, a maximum of 3 credits may be applied toward the climate dynamics PhD.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

CLIM 996 - Doctoral Reading and Research
Reading and research on a specific topic in climate dynamics under the direction of a faculty member.

**Prerequisite(s):** Admission into climate dynamics doctoral program and permission of instructor.

**Notes:** May be repeated as necessary.

**Hours of Lecture or Seminar per week:** 1-12
**Hours of Lab or Studio per week:** 0
**Grading:** Graduate Special

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**CLIM 998 - Doctoral Dissertation Proposal**

Credits: 1-12 (RD)
Covers development of research proposal under guidance of dissertation director and doctoral committee. Proposal forms basis for climate dynamics doctoral dissertation.

**Prerequisite(s):** Doctoral standing and permission of instructor.

**Notes:** Course may be repeated, but no more than 12 credits of CLIM 998 may be applied to doctoral degree requirements.

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**CLIM 999 - Doctoral Dissertation**

Credits: 1-12 (RD)
Doctoral dissertation research under direction of dissertation director.

**Prerequisite(s):** Admission to doctoral candidacy and permission of instructor.

**Notes:** May be repeated, but no more than 24 credits total in CLIM 998 and 999 may be applied to doctoral degree requirements.

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**College of Humanities and Social Sciences (CHSS)**

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**CHSS 310 - Introduction to Entrepreneurship**
Credits: 1 (NR)
Introduces students to the intellectual underpinnings of entrepreneurship, entrepreneurial leadership, social innovation, intrapreneurship, and social enterprise development. Students shape an entrepreneurial learning plan for their own professional development in line with their career aspirations.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**CHSS 390 - Peer Tutoring in Writing across the Disciplines**

Credits: 1 (RD)  
Experiential learning course in teaching of writing across disciplines. Students receive Writing Center training in theory and techniques of tutoring writing, and work a minimum of 3 hours per week in Writing Center. Focus is on practical application of writing theory and pedagogy from course readings, development of tutoring skills, and self-reflection through journals and final paper.

**Prerequisite(s):** Grade of A in ENGL 302/ENGH 302, 60 credits, and overall minimum GPA of 3.00 with a minimum GPA in major of 3.50.

**Notes:** Students must submit two faculty recommendations and a sample of recent academic writing, and complete an interview with the director of the Writing Center. May be repeated for a maximum of 3 credits.

**Hours of Lecture or Seminar per week:** 1-12  
**Hours of Lab or Studio per week:** 0

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**College of Visual and Performing Arts (CVPA)**

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**CVPA 101 - Arts Pass**

Credits: 2 (RD)  
Introduction to appreciation of the arts through lecture, demonstration in visual art, music, dance, and theater. Emphasizes aesthetic principles in modern society. Students attend performances and exhibitions, and develop analytical skills through written journal and discussion.

**Notes:** May be repeated for total 4 credits.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

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**CVPA 102 - Experiencing the Arts**
Reserved for high school students enrolled in CVPA. Introduces collaborative and interdisciplinary arts experiences in visual art, music, dance, theater, film, and media through daily intensive immersion in the arts for two and a half weeks.

**CVPA 105 - Special Topics in the Arts**

Credits: 1-3 (RT)
Exploration of topical studies on the arts.

*Notes:* Subject matter varies. May be repeated for a maximum 12 credits when taken under different topics.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0

**CVPA 308 - Cross-Cultural Arts Appreciation**

Credits: 3 (RT)
Provides cumulative arts experience by tying subject matter to major cultural production of Center for the Arts.

*Notes:* Subject matter varies. May be repeated for maximum 12 credits when taken under different topics.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**CVPA 399 - Special Topics in the Arts**

Credits: 1-6 (RT)
In-depth presentation and exploration of topical studies on the arts.

*Notes:* Subject matter varies. May be repeated for maximum 24 credits when taken under different topics.

**Hours of Lecture or Seminar per week:** 1-6
**Hours of Lab or Studio per week:** 3

**CVPA 430 - Topics in Arts and Wellness**

Credits: 1-3 (RD)
In-depth presentation and exploration of topical studies in arts and wellness or related areas such as injury prevention, performance enhancement, and health and wellness training.

*Prerequisite(s):* Junior standing, or permission of instructor.
Notes: Topic depends on instructor. May be repeated for up to 9 credits if taken under different topics.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CVPA 489 - Field Experience in the Arts

Credits: 3-6 (RT)
Apprenticeship, internship, or project with organization or individual in the arts. Must be prearranged with division director before enrollment.

Prerequisite(s): Junior standing; completion of 6 credits in CVPA courses in area of residency; CVPA 305; or permission of instructor.

Notes: May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0

CVPA 499 - Research/Performance/Topics in the Arts

Credits: 3-6 (RD)
Advanced research, performance, or exploration of topical studies in arts.

Prerequisite(s): Permission of department chair.

Notes: May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CVPA 530 - Topics in Arts and Wellness

Credits: 1-3 (RD)
In-depth presentation and exploration of topical studies in arts and wellness and/or related areas (e.g., injury prevention, performance enhancement, health and wellness training to educators and arts professionals). Topic depends on instructor.

Prerequisite(s): 90 hours or permission of the instructor.

Notes: May be repeated up to 9 credits if taken under different topics.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
CVPA 592 - Special Topics in Interdisciplinary Arts Studies

Credits: 1-3 (RT)
Topics in interdisciplinary arts.

Prerequisite(s): Undergraduate degree or equivalent, or permission of instructor.

Notes: May be repeated for maximum 12 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CVPA 599 - Independent Study

Credits: 1-6 (NR)
Independent reading, performance, or research on specific project under direction of selected faculty member. May include attendance in parallel undergraduate course.

Prerequisite(s): Undergraduate degree or equivalent, or permission of instructor.

Notes: May be repeated for total 12 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CVPA 700 - Academic Writing in the Arts

Credits: 1 (RD)
Prepares graduate students for the rigors of academic writing in the arts at the advanced level and supports students' acculturation in the academic writing skills and practices of their discourse communities.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit only

CVPA 701 - Thesis and Project Writing

Credits: 1 (RD)
Students will develop an expertise within the specific rhetorical context of the thesis/project genre, understand the specialized features of the final project or thesis, and apply the strategies they have learned in their disciplines to their capstone event.

Prerequisite(s): Completion of 21 graduate credits in a CVPA graduate degree.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only
College Teaching (CTCH)

Offered by the College of Humanities and Social Sciences

CTCH 592 - Special Topics in Education

Credits: 3 (RT)
Addresses current issues in colleges and universities, with particular attention to the multiple purposes of contemporary higher education.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 601 - The Community College

Credits: 3 (NR)
Studies institutional character of the community college, including history, purpose, clientele, organization, finance, and social function. Studies issues currently faced by community colleges.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 602 - College Teaching

Credits: 3 (NR)
Describes issues that affect teaching and learning, and provides basic tools to use in college classroom. Teaches how to plan course, develop syllabus, promote learning among diversity of students, and implement classroom assessment techniques.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 603 - Technology in Higher Education

Credits: 3 (NR)
Overview of technology issues in higher education and hands-on experience with select technology tools to enhance productivity and classroom and online learning. Examines issues related to using technology in administration, teaching and learning, and guides in developing policies and effective technology-enhanced learning activities for students.

Prerequisite(s): Basic familiarity with computer operations
CTCH 604 - The Scholarship of Teaching and Learning

Credits: 3 (NR)
Overview of the movement in higher education in scholarship of teaching and learning. Focuses on ways students learn, how learning can be improved, and different methods of conducting research into teaching and learning.

CTCH 605 - Curriculum and Program Design and Assessment

Credits: 3 (NR)
Prepares for designing, implementing, and assessing new courses, curricula, and programs. Examines relationships of courses and curricula to larger programs and institutional goals. Explores program planning and implementation such as documenting need, generating cost estimates, and assembling strong case for new programs.

Prerequisite(s): CTCH 601 or 602, and 603.

CTCH 606 - Diversity in Higher Education

Credits: 3 (NR)
Explores instructional interactions and communication strategies for diverse learner populations. Includes discussion of sociological, behavioral, and cognitive theory on culture.

CTCH 621 - Higher Education in the United States

Credits: 3 (NR)
History of higher education from colonial period to the present. Examines philosophic, political, social, and economic forces that have influenced development. Reviews today's issues and challenges.
CTCH 622 - Organization and Administration in Higher Education

Credits: 3 (NR)
Provides concepts of organization and administration in contemporary institutions from macro to micro perspectives. Studies theory and practices of the organization as it relates to governance, structure, and management of the institution.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 624 - Finance and Fiscal Management in Higher Education

Credits: 3 (NR)
Overview of higher education finance and fiscal management.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 626 - Assessment in Higher Education

Credits: 3 (NR)
Focuses on political and historical context of assessment in higher education, and teaches strategies for classroom, program, and institutional assessment. Develops skills in survey and focus group research, and teaches how to develop and implement assessment plan.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 641 - Introduction to Counseling

Credits: 3 (NR)
Introduces profession and its practice in various settings. Examines history and development of counseling; national associations; ethical code; standards for preparation and credentials; and roles, functions, and responsibilities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 643 - Counseling Theory and Practice in Higher Education

Credits: 3 (NR)
Study of historical contemporary approaches to counseling. Emphasizes applications of theoretical models as appropriate for higher education.

Prerequisite(s): CTCH 641.
CTCH 644 - Student Services in Higher Education

Credits: 3 (NR)
Focuses on development and organization of student personnel programs and services in institutions of higher learning. Covers philosophy, methods, and techniques.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 645 - The Contemporary College Student

Credits: 3 (NR)
Analyzes changing demographics, barriers, and developmental issues facing college students. Studies impact of college environment on student development, and interaction between students of varying subcultures and the environment. Examines technology issues and their impact.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CTCH 685 - Practicum

Credits: 3 (RD)
Serves as an essential part of the certificate and MAIS programs. Supervised on-the-job experience in approved college or university setting or public agency involved in higher education. Develops skills applicable to college-based teaching or higher education administration or policy. Approval of practicum coordinator needed one semester before registration.

Prerequisite(s): Admission to certificate, MAIS/CCT or MAIS/Higher Education program; approval of advisor and practicum coordinator; 12 credits of core requirements; and 3 additional credits.

Notes: Minimum 150 hours of work and participation in internship seminar. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: S/NC

CTCH 792 - Special Topics in Higher Education

Credits: 1-3 (RT)
Covers current issues in teaching and learning in higher education.

Prerequisite(s): Admission to doctoral program or permission of instructor.
Notes: May be repeated for a maximum of 12 credits when topic is different.

CTCH 821 - History of Higher Education in the United States

Credits: 3 (NR)
Key issues and moments in the history of higher education are examined as a way to understand current structures, cultures, policies, and purposes. Historical perspective will also be used to consider the near future of higher education. Students will examine current trends and possible futures for a specific topic by doing historical research on the issue.

CTCH 826 - Advanced Institutional and Program Assessment in Higher Education

Credits: 3 (NR)
Examination of educational assessment and evaluation, practices, and methods. Students critique and design an evaluation study and an evaluation report. Reviews ethical issues and impact of assessment and evaluation for students, employees, and programs.

CTCH 830 - Ethics in Higher Education: Personal, Organizational, and Institutional Realities

Credits: 3 (NR)
Explores theories, definitions, and applications of ethics across multiple higher education settings, with particular attention to critical theory contributions. Includes an in-depth analysis of major complex ethical issues in higher education settings using ethical frameworks.

CTCH 885 - Doctoral Internship in College Teaching and Administration

Credits: 3 (RT)
Supervised internship at a community college, four-year college or university, or nonteaching higher-education setting such as a government agency or administrative office. Develops skills applicable to college teaching or higher education administration or policy. Students must complete a minimum of 180 hours of work and participate in internship seminar.

Prerequisite(s): Admission to doctoral program, approval of advisor and internship coordinator, 18 credits of graduate course
work.

Notes: Students must contact the program at least one semester before enrolling. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: S/NC

CTCH 897 - Directed Reading in Higher Education

Credits: 1-6 (RD)
Independent reading on topic agreed on by student and instructor.

Prerequisite(s): Admission to doctoral program and permission.

Hours of Lecture or Seminar per week: 1-18
Hours of Lab or Studio per week: 0

CTCH 998 - Doctoral Dissertation Proposal

Credits: 1-3 (RD)
Contact program for permission to register. Work on research proposal that forms basis for doctoral dissertation.

Prerequisite(s): Completion of at least one internship and all other course work and qualifying exams.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NC

CTCH 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral dissertation research and writing under direction of dissertation committee.

Prerequisite(s): CTCH 998, two internships, and appointed dissertation committee.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NC

Communication (COMM)

Offered by the College of Humanities and Social Sciences
COMM 100 - Public Speaking

Credits: 3 (NR)
Presents principles to develop effective presentations for public and professional settings while integrating appropriate technologies. Emphasizes analyzing audience; composing meaningful, coherent messages; conducting responsible research; developing effective arguments; and improving delivery skills to strengthen confidence and credibility.

Fulfills general education requirement in oral communication.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 101 - Interpersonal and Group Interaction

Credits: 3 (NR)
Presents principles to develop appropriate and effective communication strategies in one-to-one and small group communication settings. Emphasizes analyzing and assessing communication skills to create and sustain effective communication in personal and professional relationships.

Fulfills general education requirement in oral communication.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 140 - Forensics Seminar in Creative Arts

Credits: 1 (RT)
Intensive work in creative forensics events, including rhetorical criticism and informative, persuasive, extemporaneous, after-dinner, and impromptu speaking.

Prerequisite(s): Audition.

Notes: May be taken four times.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 6

COMM 141 - Forensics Seminar in Recreative Arts

Credits: 1 (RT)
Intensive work in recreative forensic events, including dramatic duo, program interpretation, poetry interpretation, dramatic interpretation, and prose interpretation.

Prerequisite(s): Audition.

Notes: May be taken four times.
Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 6

**COMM 142 - Forensics Seminar in Debate: Affirmative Strategies**

Credits: 1 (RT)
Work in affirmative research, case construction, and oral presentation, directed toward affirmative analysis of intercollegiate debate proposition.

Notes: May be taken four times.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 6

**COMM 143 - Forensics Seminar in Debate: Negative Strategies**

Credits: 1 (RT)
Work in negative research, case attacks, and oral presentation directed toward negative analysis of intercollegiate debate proposition.

Notes: May be taken four times.

Hours of Lecture or Seminar per week: 0-4
Hours of Lab or Studio per week: 6

**COMM 145 - Newspaper Workshop I**

Credits: 1 (RT)
Practical experience in writing, editing, or business aspects of newspaper production at Broadside or other papers. Coordinated by newspaper faculty advisor.

Notes: May be repeated for total 3 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2

**COMM 148 - Radio Workshop I**

Credits: 1 (RD)
Practical experience in production, news writing, promotions, advertising, public relations, programming, or newscasting for student radio station WGMU.

Prerequisite(s): 100-level COMM course, or permission of instructor.
COMM 150 - Communication Skills for International Students

Credits: 3 (NR)
Introduction to speaking, listening, and nonverbal skills required to communicate appropriately in university study.

Prerequisite(s): International student in first year of study in the United States, non-native speakers of English with some difficulty speaking clearly and accurately, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 157 - Video Workshop

Credits: 1 (RD)
Practical experience in learning production basics including camera, video, and lighting.

Notes: Students who have already completed or are in COMM 355 are not eligible to take this course. May be taken three times.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2

COMM 200 - Communication Theory

Credits: 3 (NR)
Introduces the field of communication, including perspectives on theory and research, topical areas within the discipline, basic research methodologies, and a survey of theories in those areas. Covers basic procedures for theory-building, research, and writing about communication.

Prerequisite(s): Declared major or minor in Communication, undeclared major, or permission of undergraduate program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 201 - Small Group Communication

Credits: 3 (NR)
Principles of communicating effectively in small group situations. Emphasizes problem-solving group communication. Practice
in working cooperatively with others to complete projects using systematic approach to problem solving.

Prerequisite(s): COMM 101 or equivalent course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 202 - Media and Society

Credits: 3 (NR)

Examines the relationship between media and society through the study of the development of various media systems in the United States, including print media, radio, television, film, the recording industry, and new communication technologies. Introduces media effects and basic theories.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 203 - Introduction to Journalism

Credits: 3 (NR)

American journalism including history and First Amendment components; role of professional journalist; print, broadcast, and computer assisted news operations; economics of publishing; and effect of new technologies. Serves as starting point for those interested in journalism careers, and as orientation for those interested in learning more about news business operations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 210 - Voice and Articulation

Credits: 3 (NR)

Principles of voice production, with practice in effective vocal use of American English. Emphasizes student participation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 230 - Case Studies in Persuasion

Credits: 3 (NR)

Examines common persuasive message strategies and approaches. Covers basic principles of persuasive process. Case studies include advertisements, speeches, and persuasive activities from all segments of society.
COMM 249 - Communication Industry Experience

Credits: 2 (RD)
On-site training related to one of the five communication department concentration fields through faculty-approved field work-study programs. Related class work includes navigating in-process media workplace culture and the post-CIE progression, including refining the resume, preparing for the COMM 450 internship, and ultimately interviewing for a job.

Prerequisite(s): 45 credits total, 6 credits in COMM.

Notes: May be repeated for maximum of 4 credits.

COMM 255 - Introduction to Media Literacy

Credits: 3 (NR)
Principles and practices of media literacy. Emphasizes critical viewing, listening, and reading media skills; and media effects on consumer.

COMM 260 - Basic Debate Theory and Practice

Credits: 3 (NR)
Theory and practice of formal debate, including approaches to analytical reasoning, research, delivery, and conceptual basis for debate. Does not require tournament participation.

COMM 261 - Theories of Argumentation

Credits: 3 (NR)
Analyzes argument within communicative settings. Emphasizes deductive and inductive forms of reasoning, fallacies in reasoning, tests of evidence, and models for such analyses.
COMM 300 - Foundations of Public Communication

Credits: 3 (NR)
Theories and principles of public communication, emphasizing methods of persuasion, critical analysis, speaker-listener alignments in public setting, and measurements of effective public communication.

Fulfills writing intensive requirement in the major.

Prerequisite(s): COMM 200 with a grade of C or better. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 301 - Foundations of Interpersonal Communication

Credits: 3 (NR)
Theories and principles of interpersonal communication emphasizing models of communication, verbal and nonverbal message systems, and analysis of communicative relationships.

Prerequisite(s): COMM 200 with a grade of C or better. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 302 - Foundations of Mass Communication

Credits: 3 (NR)
Theories and principles of mass communication emphasizing effects, the media as institution, and role of society.

Prerequisite(s): COMM 200 with a grade of C or better. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 303 - Writing across the Media

Credits: 3 (NR)
Foundation course focusing on writing for the mass media: Internet, public relations, newspapers, broadcast (television and radio) and advertising with a strong emphasis on adherence to Associated Press Style.

Prerequisite(s): 30 credits.

Notes: Prerequisite for all communication media writing courses. Lab work required.
COMM 304 - Foundations of Health Communication

Credits: 3 (NR)
Explores health communication research practice: the role of communication in health care delivery, health promotion and disease prevention, risk communication, and personal as well as psychological well-being. Examines interpersonal, organizational, team, family, and intercultural relationships.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 305 - Foundations of Intercultural Communication

Credits: 3 (NR)
Analyzes communication variables as they relate to intercultural encounters. Emphasizes culture's influence on communication process, particularly influence of verbal and nonverbal communication on how message is interpreted.

Fulfills general education requirement in global understanding.

Prerequisite(s): 3 credits of 100 or 200-level COMM courses or 60 credits.

Notes: Communication majors are encouraged to complete COMM 200 prior to enrolling in this course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 306 - Issues in Intercultural Communication

Credits: 3 (NR)
Applies basic principles of intercultural communication to analyze specific situations involving communication and cultural differences.

Prerequisite(s): COMM 305, or permission of instructor.

Notes: Continuation of COMM 305.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 307 - Field Study in Communication
Structured communication learning experience: one to three weeks of travel in a foreign environment involving another country or relevant U.S. co-cultures. Students must complete appropriate readings, laboratory assignments, and personal learning paper to process communication concepts and experiences.

Prerequisite(s): Permission of instructor

Notes: May be repeated for a maximum of 6 credits when field study is different.

COMM 310 - Oral Interpretation

Credits: 3 (NR)
Principles and theories of oral interpretation. Practice in oral communication of prose, poetry, and drama.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 320 - Business and Professional Communication

Credits: 3 (NR)
Study of basic theories and skills of communication in professional contexts, including interviewing, relationship maintenance, small group teams, and public presentations. Emphasizes developing practical and critical thinking skills.

Prerequisite(s): COMM 100, 101 or 104 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 326 - Rhetoric of Social Movements and Political Controversy

Credits: 3 (NR)
Social and political forces of contemporary era from communication perspective, emphasizing political leadership, pressures for social and political change, and transformations in communicative environment.

Fulfills general education requirement in synthesis.

Prerequisite(s): COMM 300.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 330 - Principles of Public Relations
Credits: 3 (NR)
Surveys nature, history, scope, and practice of public relations in business, trade associations, nonprofit organizations, and educational and government institutions. Covers principles, practice of public relations, including media relations, issues management, and public service announcements; marketing and research; planning and publicity for special events; house publications; and institutional advertising.

Prerequisite(s): 3 COMM credits and 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 332 - Nonverbal Communication

Credits: 3 (NR)
Theory, principles, and methods to analyze nonverbal communication. Emphasizes physical behavior, facial expression, personal space and territoriality, physical appearance, vocal cues, and environment.

Prerequisite(s): 3 COMM credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 335 - Organizational Communication

Credits: 3 (NR)
Theory, practice, and methods to analyze communication in organizations. Emphasizes process and structure, interaction formats, mechanisms for modification, and career paths in organizational communication.

Prerequisite(s): COMM 100, 101, or 301; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 340 - Forensics Seminar in Creative Arts

Credits: 1 (RT)
Intensive work in various types of creative forensics events, including rhetorical criticism and informative, persuasive, extemporaneous, after-dinner, and impromptu speaking.

Prerequisite(s): Completion of 60 hours, or 4 hours of COMM 140. Audition required.

Notes: May be taken four times.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 6
COMM 341 - Forensics Seminar in Recreative Arts

Credits: 1 (RT)
Intensive work in various types of recreative forensics events, including dramatic duo, program interpretation, poetry interpretation, dramatic interpretation, and prose interpretation.

Prerequisite(s): Completion of 60 hours, or 4 hours of COMM 141. Audition required.

Notes: May be taken four times.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 6

COMM 342 - Forensics Seminar in Debate: Affirmative Strategies

Credits: 1 (RT)
Work in affirmative research, case construction, and oral presentation directed toward affirmative analysis of intercollegiate debate proposition.

Prerequisite(s): 4 credits of COMM 142, or 60 credits and audition.

Notes: May be taken four times.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 6

COMM 343 - Forensics Seminar in Debate: Negative Strategies

Credits: 1 (RT)
Work in negative research, case attacks, and oral presentation directed toward negative analysis of intercollegiate debate proposition.

Prerequisite(s): 4 credits of COMM 143, or 60 credits and audition.

Notes: May be taken four times.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 6

COMM 344 - Parliamentary Procedure

Credits: 1 (NR)
Procedures of parliamentary law as practiced in voluntary organizations. Practice in leading groups that conduct business according to Roberts Rules of Order, Newly Revised. Brief review of other parliamentary manuals.

Prerequisite(s): 60 credits, or permission of instructor.
COMM 345 - Newspaper Workshop II

Credits: 1 (RT)
Practical experience in writing and editing for student newspaper or other papers.

Prerequisite(s): 3 credits of COMM 145, COMM 351, or permission of instructor

Notes: May be taken three times.

COMM 346 - Yearbook Workshop

Credits: 1 (RT)
Practical experience in promotion, marketing, and sales of video yearbook, or practical experience working on Senior Expressions, a print supplement to the video yearbook.

Notes: May be taken three times.

COMM 347 - Cable TV Programming and Marketing

Credits: 1 (RD)
Practical experience in television programming, promotion, and marketing of a campus television cable network operation.

COMM 348 - Radio Workshop II

Credits: 1 (RT)
Intense practical application of previously acquired skills in production, promotions, advertising, public relations, programming, or news writing for student radio station WGMU.

Prerequisite(s): COMM 148, or permission of instructor.

Notes: May be taken three times.
COMM 350 - Mass Communication and Public Policy

Credits: 3 (NR)
Investigates how matters of public importance are communicated via various mass communication channels. Emphasizes regulations to minimize influence of mass media on public decision-making, and media manipulation by pressure groups, politicians, and media gatekeepers.

Prerequisite(s): COMM 102, 202, or 302; or permission of instructor.

COMM 351 - News Writing and Reporting

Credits: 3 (NR)
Experience in actual news gathering. Students write and report for print and online outlets. Numerous inclass and out-of-class writing assignments train students in unique styles of print and online journalism.

Prerequisite(s): COMM 303. Prerequisite enforced by registration system.

COMM 352 - News Editing: Print and Beyond

Credits: 3 (NR)
Copy preparation, headline writing, news judging, and layout for various forms of print and electronic formats. Introduces working on news copy desks.

Prerequisite(s): COMM 303. Prerequisite enforced by registration system.

COMM 353 - Broadcast Journalism

Credits: 3 (NR)
Prerequisite(s): COMM 303. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 354 - Radio Production

Credits: 3 (NR)
Theory and practice of operational radio broadcasting. Topics include programming, production, and promotion aspects of commercial and noncommercial radio.

Prerequisite(s): COMM 302, or permission of instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 4

COMM 355 - Video Principles and Practices

Credits: 3 (NR)
General introduction to video production including camera, audio, lighting, and editing. Lab work required.

Notes: Lab work required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

COMM 356 - Video: Performance and Writing

Credits: 3 (NR)
Writing for video, performance skills for on-air work, interviewing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 358 - Video Producing and Directing

Credits: 3 (NR)
Introduces techniques, theory, and practices in producing and directing including studio and field producing and directing, budget, floor plans, and production material associated with video productions.

Prerequisite(s): COMM 355 with a grade of 2.00 or portfolio assessment.
COMM 359 - Media Management

Credits: 3 (NR)
Principles, practices of media management from general techniques to operation of individual departments within a media organization.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 360 - Video Editing

Credits: 3 (NR)
Focus on advanced techniques in digital editing, software associated with video editing (Final Cut Pro), theories of video editing and necessary skills associated with digital editing.

Prerequisites: COMM 355 with a grade of 2.00 or better or portfolio assessment.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 3

COMM 361 - Online Journalism

Credits: 3 (NR)
Focuses on online journalism, research, reporting, web page and weblog creation, and writing for Internet.

Prerequisites: COMM 303, or permission of instructor Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 362 - Argument and Public Policy

Credits: 3 (NR)
Develops argumentative skills while examining contemporary public policy. Applies methods of argumentative analysis to design, implementation of public policy. Students learn by constructing, examining, and using public argument.

Fulfills general education requirement in synthesis.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 363 - Media Career Seminar

Credits: 1 (NR)
Practicum for students with production experience; students produce a final resume in area of expertise.

Prerequisite(s): Two courses completed in area of media production focus.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3

COMM 364 - Videography

Credits: 3 (NR)
Focus on camera techniques such as framing, editing within the camera, shot composition, storyboarding, camera angles, video levels, and continuity.

Prerequisite(s): COMM 355 with a grade of 2.00 or better or portfolio assessment.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 365 - Gender, Race, and Class in the Media

Credits: 3 (NR)
Introduces concepts of power, influence of mass media. Allows students to see themselves as products, producers of media influence, and gives sense of the roles in the media or lack thereof, of groups based on their gender, race and/or class.

Prerequisite(s): COMM 302, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 366 - Visual Communication

Credits: 3 (NR)
Teaches visual communication theories and applies them to creation of videos, web pages, multimedia production, Computer Based Training (CBT) and other technologies. Covers limits of visual communication in terms of perception, economics, and technology. Partial distance course includes viewing video modules, and using electronically mediated discussion.

Prerequisite(s): COMM 355. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 370 - Feature Writing

Credits: 3 (NR)
Introduces aspiring journalists to research techniques and critical writing skills needed to produce publishable magazine or newspaper feature stories.

Prerequisite(s): COMM 303. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 371 - Sports Writing and Reporting

Credits: 3 (NR)
Experience in actual sports-related news gathering and reporting. Covers writing and reporting on sports-related subjects for print and online media. Numerous in-class and out-of-class writing assignments train students in the unique style of covering sports events, reporting breaking news, and writing feature stories.

Prerequisite(s): COMM 303 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 372 - Sports and the Media

Credits: 3 (NR)
Examines the role of mass media in constructing images of athletes, sport, and sports culture. Critical attention is given to broadcast, print, and film of sport media. Assesses sociological and cultural issues that shape sport media and culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 373 - Business and Economic Journalism

Credits: 3 (NR)
Writing and reporting about business and the economy with focus on understanding financial news, and reporting about companies, trade, and markets for print, broadcast, and online media. Students practice through in-class and out-of-class writing assignments.

Prerequisite(s): COMM 303. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 374 - Political Journalism

Credits: 3 (NR)
Writing and reporting about politics, elections and campaigns, and the legislative and executive branches of government for print, broadcast, and online media. Students practice the style and substance of covering political news through in-class and out-of-class writing assignments. A unique collaboration with C-SPAN including video conference opportunities with political and media personalities.

Prerequisite(s): COMM 303 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 375 - Mass Communication Advertising and Promotions

Credits: 3 (NR)
History, regulation, and ratings of advertising, as well as media buying, advertising campaigns, and strengths and weaknesses of media vehicles used in advertising.

Prerequisite(s): COMM 302, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 380 - Media Criticism

Credits: 3 (NR)
Examines practical criticism of a wide variety of media texts including television programs, newspapers, articles, films, photographs, and advertisements. Introduces principles of major contemporary modes of analysis for systematically interpreting visual and verbal forms of communication.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 389 - Public Relations for Associations and Nonprofits

Credits: 3 (NR)
Principles of editing and journalism applied to publications, public relations, and advertising needs within corporate environment. Job requirements of editorial positions in public relations, publications, and information as defined by trade associations, nonprofit organizations, and large corporations.

Prerequisite(s): 60 credits, or 3 credits of lower-division COMM courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 390 - Issues in Public Relations

Credits: 3 (NR)
Focuses on current issues in corporate, government, and nonprofit public relations.

Prerequisite(s): COMM 330.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 391 - Writing for Public Relations

Credits: 3 (NR)
Focuses on public relations writing including news releases, client memos, broadcasting, speeches, brochures, journals, and advertisements. Includes writing styles, formats, organization, and writing research.

Prerequisite(s): COMM 303.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 392 - Public Relations Study Abroad

Credits: 3 (NR)
Concentrated survey course in public relations for business, trade associations, nonprofit organizations, and governmental institutions from the perspective of a location abroad. Emphasis is placed on the global and intercultural aspects of public relations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 398 - Research Practicum in Communication

Credits: 1-3 (RD)
Work individually with a faculty member on a faculty research project. Requires readings in research methods and topic area and a final project.

Prerequisite(s): 60 credits including at least 9 hours of COMM credit toward the major; minimum GPA of 2.5 overall and 3.0 in the major; approval of department.

Notes: Students must submit an application for COMM 398 at least one week prior to the beginning of the semester. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-12
COMM 399 - Special Topics in Communication

Credits: 1-3 (RT)
Topics vary; some require laboratories.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 400 - Research Methods in Communication

Credits: 3 (NR)
Explores applications for primary research methodologies used in communication. Research project, with focus on survey, critical ethnographic, or experimental methodologies.

Prerequisite(s): COMM 200 and two of COMM 300, 301, 302, 305 each one with a minimum grade of 2.00 (C). Prerequisite enforced by registration system.

Notes: Students may not receive credit for both COMM 400 and COMM 490.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 401 - Interpersonal Communication in the Workplace

Credits: 3 (NR)
Comprehensive study of theories and research associated with dynamics of interpersonal relationships in the workplace. Emphasizes individual motivation, interpersonal needs, communication styles, leadership, problem solving, decision making, diversity, interpersonal conflict, individual adaptation to organizational change, and influence of technology on workplace relationships.

Prerequisite(s): COMM 301, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 411 - Public Relations Practicum

Credits: 3 (NR)
Helps communication majors to apply their public relations education. Covers three general areas: public relations theory and applications, writing and editing, and networking/story placement. Includes public relations strategy and tactics, interviewing and analysis, writing and message delivery.
Prerequisite(s): COMM 330.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**COMM 412 - Politics and the Mass Media**

Credits: 3 (NR)  
Covers responsibilities, freedoms of mass media in a democracy; and media influence on citizens' opinions, elections, and decisions of public officials.

Equivalent to GOVT 412

Prerequisite(s): GOVT 103, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**COMM 420 - Senior Seminar in Theories of Communicative Interaction**

Credits: 3 (NR)  
Explores primary theories explaining human communicative behavior, including traditional rhetorical, contemporary social science, critical, and mass communication.

Prerequisite(s): 3 credits of 100 or 200-level COMM courses or 60 credits; grade of C or better in COMM 200.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**COMM 425 - Honors Seminar in Communication**

Credits: 3 (NR)  
Examines foundations, connectedness, and applications of numerous communication theories across the discipline.

Prerequisite(s): Permission of instructor.

Notes: Honors project required.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**COMM 430 - Persuasion**
Theories of persuasive communication including traditional and contemporary attitudinal change; relationship among speaker, message, and audience; and relationship between attitudinal and behavioral change.

Prerequisite(s): COMM 230 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 431 - Information Technology and the Political Process

Credits: 3 (NR)
Studies impact of information network of wire and wireless communications and computers on political process in advanced industrial countries.

Prerequisite(s): 60 credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 432 - Political Communication

Credits: 3 (NR)
Studies how political communication shapes development of "political reality." Examines interactions between media and politics with respect to the ways communication functions in political settings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 433 - Environmental Communication

Credits: 3 (NR)
Rhetoric and persuasion about environmental issues in contemporary society. Investigation of case studies in corporate, institutional, and movement attempts to mobilize and cope with ecological concerns. Critical assessment of public communication is emphasized.

COMM 434 - Interviewing

Credits: 3 (NR)
Theory, principles, and practical skills essential to interview process. Emphasizes information gathering, journalistic, persuasive, employment, and performance-appraisal interviews.

Prerequisite(s): 60 credits or permission of instructor
COMM 435 - Computers and Communication

Credits: 3 (NR)
Offers practical application, skill development, and theoretical and critical assessment of computer-mediated communication. Discusses culture and language, functional and dysfunctional communication, social interaction, critical perspectives and ideology, freedom and responsibility, and images of future. Students contract for course assignments within course categories.

Prerequisite(s): 60 credits.

COMM 440 - Special Occasion Speaking

Credits: 3 (NR)
Provides students with the opportunities to develop speaking skills for a variety of contexts from eulogies to commencement speeches.

Prerequisite(s): 90+ hours or permission of instructor.

COMM 450 - Internship in Communication

Credits: 3 (RD)
On-the-job training in communication through approved field work study programs. Internships arranged and supervised by Department of Communication through internship coordinator. Related class work in resume preparation and job interviewing.

Prerequisite(s): 75 credits, major or minor in communication, electronic journalism or sports communication, 15 credits in COMM for majors, 12 credits for non-COMM majors, and permission of department.

Notes: See department for the application process. May be repeated for a maximum of 6 credits.

COMM 451 - Facilitating Communication Education
Theory and practice in facilitating learning of communication principles and skills. Students work as instructor aides in lower-division classes under supervision of faculty member. Activities include facilitating small-group activities, and individually critiquing oral performances.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 5

### COMM 452 - Media Production Practicum

Credits: 3 (RD)  
Theory and practice in creation, distribution, and response to media productions. Students complete minimum 150 hours of work as assistants to engineers, producers, directors, and organizers of media production facilities on campus, under supervision of faculty members. Activities include working on telecourses, public relations videos, and multimedia projects; aiding in creating in-house productions for departments; and working as cable caster for master control campus operations.

**Prerequisite(s):** COMM 303, 348, or 355.

**Notes:** May be repeated for a maximum of 6 credits.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### COMM 453 - Electronic News Gathering and Editing

Credits: 3 (NR)  
Teaches advanced journalism skills relevant to online and broadcast-based news programs. Students cover news assignments and shoot and edit into a feature suitable for a webcast or broadcast news program across media platforms.

**Prerequisite(s):** COMM 303. COMM 353 is recommended but not required.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### COMM 454 - Free Speech and Ethics

Credits: 3 (NR)  
Major issues surrounding roles of speech, press, and electronic media in society. Includes history of free speech and press issues in society, government role in regulating marketplace of ideas, and responsibility of individual in free society.

Fulfills general education requirement in synthesis.

**Prerequisite(s):** COMM 300, 302; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
COMM 455 - History of Print Journalism

Credits: 3 (NR)
Development of print journalism, emphasizing interaction of technology, audience, and government intervention. Topics include birth of press, development of modern newspaper, and American development including Revolutionary and Civil wars, rise of independent press, and yellow journalism.

Equivalent to HIST 455

Prerequisite(s): 3 credits in COMM or HIST courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 456 - Comparative Mass Media

Credits: 3 (NR)
Survey of major foreign mass media systems as they compare with American system. Focuses on broad dimensions of international mass media, and describes issues facing global journalism and media systems. Provides substantive framework to critically evaluate various national media systems.

Fulfills general education requirement in global understanding.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 465 - Topics in Communication and Gender

Credits: 3 (RT)
Topics may include gender and culture, women as rhetors, male and female communication, and communication and gender roles. Examines specific interests, ideally in seminar setting.

Notes: May be repeated for credit when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 469 - Structure of the Telecommunications Industry

Credits: 3 (NR)
Explores complex interrelationships that affect modern telecommunications and how major mergers, acquisitions, regulatory decisions, congressional initiatives, or engineering breakthroughs can profoundly affect telecommunications industry at any given time.
Prerequisite(s): 90 credits or permission of instructor.

Notes: Serves as capstone seminar in telecommunications minor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 475 - Journalism Law

Credits: 3 (NR)
Examines law as it relates to working journalist. Topics include libel, invasion of privacy, free press and fair trial, First Amendment, broadcast regulation, access to media, advertising, and effect of new technologies on these issues. Uses case approach to study leading court decisions in mass media law.

Prerequisite(s): 60 credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 480 - College to Career: Strategies for Transition

Credits: 1 (NR)
Designed to assist soon to be graduates in the employment transition process. Fundamental to the course are effective communication skills, creative research and the desire to actively and aggressively seek meaningful employment.

Prerequisite(s): 90+ credits or permission of instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 1-12

COMM 490 - Honors Research Methods in Communication

Credits: 3 (NR)
Honors version of COMM 400.

Prerequisite(s): Admission to honors in the major.

Notes: Students may not receive credit for both COMM 400 and 490.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 491 - Honors Research Project in Communication

Credits: 3 (RT)
Completion of independent honors research project under the guidance of the student's faculty sponsor.

Prerequisite(s): Completion of COMM 490 with minimum grade of 3.0 and approval of honors project prospectus.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 499 - Independent Study in Communication

Credits: 1-3 (RT)
Study of a selected area in communication. Independent study application must be processed before start of semester in which work is to take place.

Prerequisite(s): 75 credits and permission of department.

Notes: May be repeated for credit with permission of director of undergraduate program. Communication courses at the 500 level open to post-baccalaureate students or advanced undergraduates with permission of department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

COMM 504 - Communication and Interpersonal Conflict

Credits: 3 (NR)
Focuses on interpersonal interactions, including dyadic and small-group levels in various settings such as friendships, marriage, family, and workplace. Examines factors that generate conflicts, and communication strategies and skills that help shape conflict interaction toward productive ends.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 506 - Communication in International Organizations

Credits: 3 (NR)
Analyzes communication variables as they relate to organizational and managerial functions in international organizations. Topics include developing understanding of how cultural differences influence managerial activities, and learning to deal effectively with differences.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 530 - Theories of Small Group Communication

Credits: 3 (NR)
Advanced-level theory and practice of small group interaction. Examines current research, focusing on learning applications of theories to relevant settings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 590 - Seminar in Communication

Credits: 3 (RT)
Intensive study of specific topics; content varies.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 600 - Introduction to Graduate Studies

Credits: 3 (NR)
This course offers a broad introduction to the field of communication in terms of communication-based theories and research.

Prerequisite(s): Admission to graduate program in communication or permission of graduate program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 601 - Communication in Professional Relationships

Credits: 3 (NR)
Explores theoretical perspectives and relevant research to communication strategies and skills for various professional roles and situations. Relates theoretical foundations to practice, assessing theories and applications in individual professional fields.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 602 - Theories and Research of Mass Communication

Credits: 3 (NR)
Explores theories that have guided development of mass media. Emphasizes major scientific and humanistic approaches to mass media effects.
COMM 604 - Communication Research Practicum

Credits: 3 (NR)
Helps communication master's students determine focus for program of study, thesis, and projects. Includes readings in applied communication research and exercises in topic selection, analysis.

Prerequisite(s): COMM 634 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 605 - Intercultural Communication

Credits: 3 (NR)
Analyzes communication variables related to communication across cultures. Topics include nonverbal communication, time conceptualizations, perceptions and attitudes, values, social organization patterns, cultural norms, language, ethics, conflict across cultures, and research in intercultural communication.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 615 - Political Communication

Credits: 3 (NR)
Analyzes how political communication messages and strategies shape the development of perceptions and behavior in US presidential elections. Examines the interactions between media content and political action in election campaigns.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 620 - Health Communication

Credits: 3 (NR)
Examines interpersonal communicative processes associated with health in consumer-provider, family, and health communication campaign contexts. Particular attention to understanding cultural differences in perceptions of and communication about health and disease.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 630 - Theories of Public Relations

Credits: 3 (NR)
Provides a survey of public relations theories and major ethical issues. Examines ways theories relate to organizations, mass and international communication research, rhetoric, persuasion, and social movements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 631 - Approaches to Group Facilitation

Credits: 3 (NR)
Introduces various theoretical and practical approaches to group facilitation with in-depth focus and practice in one approach. Students participate in group sessions, analyze videotapes of decision-making groups, and practice methodologies for facilitating group interaction.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 634 - Theories of Interpersonal Communication

Credits: 3 (NR)
Analyzes contemporary theories, concepts, and approaches to improving interpersonal communication. Examines interpersonal communication research.

Prerequisite(s): COMM 301 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 635 - Organizational Communication

Credits: 3 (NR)
Analyzes communication systems, processes in public and private organizations. Topics include conflict management, group decision making, interviewing, technical presentations, and using various channels for improving internal and external communication.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 636 - Communication Consulting

Credits: 3 (NR)
Investigates theories providing foundation for communication consulting. Provides theoretical information and mechanisms for
application necessary to modify communicative behavior within organizations.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**COMM 637 - Risk Communication**

Credits: 3 (NR)  
Research on sharing information about physical hazards such as toxic waste, radiation, disease, injury, biohazards. Topics include communication concerning workplace safety, environmental problems, risk assessments, and scientific uncertainties.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**COMM 639 - Science Communication**

Credits: 3 (NR)  
Reviews research on best practices in science communication for scientists and communication professionals. Explores theory on conceptualizing science communication as disseminating knowledge, promoting informed decision making, involving citizens in scientific research (i.e., citizen science), promoting legislative and individual actions, or creating entertainment. Students practice communicating complex science and designing contexts for public engagement with scientific research.

**Prerequisite(s):** Graduate Standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**COMM 640 - Controversies in Science Communication**

Credits: 3 (RD)  
Examines the communication implications related to selected current topics of scientific controversy.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**COMM 641 - Communication Competencies for Scientists**

Credits: 3 (NR)  
Examines the specific oral, written, and mediated communication competencies needed by scientists in modern society.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
COMM 642 - Science and the Public

Credits: 3 (NR)
Examines the relationship between science and society, with a particular emphasis on the role of communication in shaping public opinion on issues related to science and technology.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 644 - Analysis and Criticism of Science Journalism

Credits: 3 (NR)
Examines media coverage of technically complex topics in science, social science, environment, health and medicine, and technology. Explores the influence of institutional media practices on news about science and technology.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 650 - Research Methodologies in Communication

Credits: 3 (NR)
Introduces various research methods used by communication professionals. Focus is to achieve understanding and knowledge of social scientific research, qualitative and quantitative, and critical analysis through use and application.

Prerequisite(s): Admission to graduate program in communication or permission of graduate program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 653 - Graduate Communication: Research and Teaching

Credits: 3 (NR)
Investigates theoretical and philosophical implications of communication instruction. Exposes graduate students to principles and practices of teaching college communication courses at upper and lower divisions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 655 - Theories of Visual Communication in Telecommunications
Theories of visual communications and how they are used in creating images for web sites, video productions, corporate presentations, virtual reality, computer graphics. Explores problems of fitting messages to various telecommunications media, how target audience perceives the visual image, and aesthetic demands of products imposed by new technologies.

**Comm 660 - Climate Change and Sustainability Communication Campaigns**

Credits: 3 (NR)
Offers practical application, skill development, and theoretical basis of communication campaigns developed in response to global warming and other threats to sustainability. Focuses on purposive campaigns to promote changes in individual behavior and public policy.

Prerequisite(s): Graduate standing.

**Comm 670 - Social Marketing**

Credits: 3 (NR)
Offers conceptual overview of social marketing, marketing methods designed to influence people to behave in ways that benefit society. Develops skills necessary to conduct a social marketing initiative and provides an opportunity for practical application of those skills.
Designated a Green Leaf Course.

**Comm 675 - Content Analysis**

Credits: 3 (NR)
Introduces content analysis, a research technique for making replicable and valid inferences about text in sources such as news articles, advertisements, and television programs. Students design and conduct research using content analysis techniques.

**Comm 690 - Special Topics in Communication**
credits: 3 (RT)
Explores contemporary issues in communication theory, research, and practice.

Prerequisite(s): Graduate standing.

Notes: Topics vary. May be repeated for a maximum of 15 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 694 - Communication Internship

Credits: 3 (NR)
Students work in approved, professional-level communication position, meeting regularly with internship supervisor from department. Requires paper, journal, minimum 60 hours work for each credit of enrollment. Students usually enroll in internships at end of program of study.

Prerequisite(s): 18 graduate credits and permission of department.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0
Grading: Graduate Special

COMM 696 - Directed Readings and Research

Credits: 1-3 (RT)
Reading and research on specific topic under direction of faculty member. Written report required; oral or written exam may be required.

Prerequisite(s): Permission of department.

Notes: May be repeated for a maximum 6 credits.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0
Grading: Graduate Special

COMM 697 - Independent Production

Credits: 1-3 (NR)
Media or creative production activities under direction of faculty member. Requires completed production; written report, oral exam may be required.

Prerequisite(s): Permission of department.

Notes: May be repeated for maximum 6 credits.
Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0
Grading: Graduate Special

COMM 705 - Intercultural Health and Risk Communication

Credits: 3 (NR)
Examines intercultural health and risk communication interventions, including health communication campaigns, public relations and advertising for health organizations, and how the media and Internet present health information.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 706 - Strategic Communication

Credits: 3 (NR)
Examines commonalities of strategic communication campaigns across fields (e.g., military, diplomacy, health, politics, marketing, public relations) in order to understand strategic communication, compare fields, and emphasize strategic and evaluative research across fields.

Prerequisite(s): COMM 630 or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 720 - Consumer-Provider Health Communication

Credits: 3 (NR)
Explores relational health communication research and practice. Examines the role of interpersonal communication in health care delivery, health promotion, disease prevention, risk communication, as well as in promoting personal and psychosocial well being.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 721 - E-Health Communication

Credits: 3 (NR)
Explores the use of computer-mediated communication technologies in health care and health promotion, including examination of technology in health information dissemination, health education, health communication interventions, and the management of health care delivery.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 725 - Qualitative Methods

Credits: 3 (NR)
Examines qualitative research in communication. Emphasis is placed on techniques of naturalistic inquiry such as observation, interviewing, focus group methods, and ethnography, as well as tools for analyzing and reporting qualitative data.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 735 - Crisis Communication

Credits: 3 (NR)
Examines crisis communication contexts with a particular emphasis on the role of communication in a variety of crises and how the media and Internet present crisis information to the public.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 750 - Research Methods II

Credits: 3 (NR)
Extends basic research knowledge and skills learned in COMM 650 Research Methods I. Students will be taught to analyze and synthesize literature, develop theoretical linkages, and construct measurement scales.

Prerequisite(s): COMM 650.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 798 - Communication Studies Project

Credits: 3 (NR)
Final research seminar for all MA in communication students. Students discuss practical and theoretical issues related to project or thesis. Includes readings related to underlying theoretical, methodological, and ethical issues facing contemporary communication researchers and practitioners.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
COMM 799 - Master's Thesis

Credits: 1-6 (RD)
Original research endeavor related to student's concentration in communication under supervision of faculty committee.

Prerequisite(s): 24 graduate credits and approval of thesis proposal by faculty committee.

Hours of Lecture or Seminar per week: 1-9
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

COMM 800 - Studies for the Doctor of Philosophy in Education

Credits: 3-6 (NR)
Program of studies designed by student's discipline director and approved by doctoral committee. Students participate in research activity of discipline director, and write paper reporting original contributions.

Notes: May be repeated.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 3-6
Grading: Graduate Special

COMM 806 - International Public Relations

Credits: 3 (NR)
Provides a survey of international public relations with an emphasis in three areas: applied knowledge for actual international practice, relevant theory, and ethical issues.

Prerequisite(s): COMM 706 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 820 - Health Communication Campaigns

Credits: 3 (NR)
Explores use of communication campaigns to promote health and reduce health risks, examines how health communication campaigns are designed, implemented, and evaluated, and describes the role of communication research throughout the campaign process.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
COMM 890 - Special Topics in Communication

Credits: 3 (RD)
Selected topics reflecting specialized areas in communication.

Prerequisite(s): PhD rank or permission of instructor.

Notes: Topics vary. May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 896 - Independent Study

Credits: 3 (RD)
Independent reading on a topic agreed on by student and faculty member.

Prerequisite(s): PhD rank or permission of instructor.

Notes: Content varies. May be repeated.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

COMM 998 - Doctoral Dissertation Proposal

Credits: 1-6 (RD)
Development of a research proposal that constitutes the basis for a doctoral dissertation.

Prerequisite(s): Approval of program director.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NS

COMM 999 - Doctoral Dissertation Research

Credits: 1-15 (RD)
Research on an approved dissertation topic under the direction of dissertation committee.

Prerequisite(s): Completion of COMM 998.

Notes: May be repeated. No more than 18 credits of COMM 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Comparative Literature (CL)

Offered by the College of Humanities and Social Sciences

CL 300 - Introduction to Comparative Literature

Credits: 3 (NR)
Introduces methods of comparative literature through study, in translation, of selected theme or motif as it appears in various periods, genres, or national literatures. Readings drawn from English, American, or European literature; on occasion, non-Western literature featured.

Prerequisite(s): 60 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CL 514 - Theories of Comparative Literature

Credits: 3 (NR)
Intensive study of major theories of comparative literature, with special emphasis on international movements and characteristic themes. Students work with texts in foreign language of their concentration; other texts studied in translation.

Prerequisite(s): CL 300 and 90 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Computational and Data Sciences (CDS)

Offered by the College of Science

CDS 101 - Introduction to Computational and Data Sciences

Credits: 3 (NR)
Introduction to the use of computers in scientific discovery through simulations and data analysis. Covers historical development and current trends in the field.

Fulfills general education requirement in natural science (nonlab).

Prerequisite(s): Appropriate score on the math placement test.
CDS 102 - Introduction to Computational and Data Sciences Lab

Credits: 1 (NR)
Experiments in computational and data sciences explore the connections between on-going advances in the natural sciences and the rapid advances in computing and data handling. Lab exercises demonstrate the use of computers in analyzing data, in modeling science problems, and in creating numerical simulations across the science disciplines.

Prerequisite(s): CDS 101
Corequisite(s): CDS 101

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

CDS 130 - Computing for Scientists

Credits: 3 (NR)
Covers use of computers to solve practical scientific problems. Topics include creating effective scientific presentations, analysis of experimental data, online literature, data/information ethics, scientific modeling, and communication/collaboration tools. Designed to equip students with the knowledge and confidence they need to use future hardware and software systems both as a student and throughout their scientific career.

Fulfills general education requirement in information technology (all).

Prerequisite(s): Passing score on the math placement test for MATH 110 or MATH 113.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CDS 151 - Data Ethics in an Information Society

Credits: 1 (NR)
Examination of ethical issues related to access and use of information and data in the Internet age, for the general student, with special emphasis on ethical issues that apply to the proper use and interpretation of scientific and technical information.

Fulfills general education requirement in information technology (ethics only).

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
CDS 251 - Introduction to Scientific Programming

Credits: 3 (NR)
Focuses on elements of programming using the Fortran language and selected elements of the C language with emphasis on the aspects used in the computational and data sciences. Conducted through a combination of lecture and interactive computer laboratory.

Equivalent to CDS 351 (2011-2012 Catalog)

Prerequisite(s): CDS 130.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer.

CDS 301 - Scientific Information and Data Visualization

Credits: 3 (NR)
The techniques and software used to visualize scientific simulations, complex information, and data visualization for knowledge discovery. Includes examples and exercises to help students develop their understanding of the role visualization plays in computational science and provides a foundation for applications in their careers.

Prerequisite(s): CDS 101 or CDS 130.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CDS 302 - Scientific Data and Databases

Credits: 3 (NR)
Data and databases used by scientists. Includes basics about database organization, queries, and distributed data systems. Student exercises will include queries of existing systems, along with basic design of simple database systems.

Fulfills writing intensive requirement in the major.

Prerequisite(s): CDS 101 or CDS 130; STAT 344 or permission of instructor.

Notes: This course meets the writing-intensive requirement for the CDS Major.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CDS 385 - Materials Science with Applications to Renewable Energy

Credits: 3 (NR)
Introduction to basic concepts and methods of materials science. Review of metallic alloys and compounds, ceramic materials,
ionic solids, semiconductors, polymers, and nano-structured materials. Mechanical, thermal, electric, magnetic and optical properties of materials. Theoretical background and experimental methods of materials characterization. Various materials applications with emphasis on renewable energy.

Equivalent to PHYS 385

**Prerequisite(s):** PHYS 262 or 266 or 245 and a C or better in MATH 113

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CDS 401 - Scientific Data Mining**

Credits: 3 (NR)

Data mining techniques from statistics, machine learning, and visualization to scientific knowledge discovery. Students will be given a set of case studies and projects to test their understanding of this field and provide a foundation for future applications in their careers.

**Prerequisite(s):** CDS 302.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CDS 410 - Modeling and Simulations I**

Credits: 3 (NR)

Numerical differentiation and integration, initial-value and boundary-value problems for ordinary differential equations, methods of solution of partial differential equations, iterative methods of solution of nonlinear systems, and approximation theory.

Equivalent to MATH 447

**Prerequisite(s):** MATH 214 or 216, and 446.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CDS 411 - Modeling and Simulations II**

Credits: 3 (NR)

Covers the application of modeling and simulation methods to various scientific applications, including fluid dynamics, solid mechanics, materials science, molecular mechanics, and astrophysics. Provides an introduction to modeling and simulation software, as well as high-performance computing.

**Prerequisite(s):** CDS 410 or Math 447

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
CDS 421 - Introduction to Computational Fluid Dynamics

Credits: 3 (NR)
The course will cover the governing equations of fluid dynamics; numerical discretization of the governing equations and popular techniques for solving flow problems; applications of CFD to some classic fluid dynamics problems; and setting up the CFD simulation using a CFD software package. At the end of the course, students will understand the process of developing a geometrical model of the flow, applying appropriate boundary conditions, specifying solution parameters, and visualizing the results. The students are expected to complete several computer projects, including writing their own CFD computer program to analyze simple fluid flow problems, as well as setting up the CFD simulation using a CFD software package.

Prerequisite(s): MATH 446, proficiency in at least one computer programming language and computer operating system, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CDS 461 - N-Body Simulation Methods

Credits: 3 (NR)
Covers particle methods to solve variety of physical systems. Emphasizes study and development of numerical results, and visualization of these results in complex physical systems. Applications and projects include stellar and galaxy dynamics, smoothed particle hydrodynamics, plasma simulations, and semiconductor device theory algorithms on parallel and vectorized systems.

Prerequisite(s): MATH 203 MATH 213 CS 211.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CDS 486 - Topics in Computational and Data Sciences

Credits: 3 (RD)
Covers selected topics in computational and data sciences not covered in fixed content courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CDS 487 - Electronic Structure Computations

Credits: 3 (NR)
The course covers computational aspects of materials science, such as first-principles methods of electronic structure calculations of periodic solids, clusters, and molecules, as well as the use of empirical potentials. Examples will be drawn from metals, insulators, and semiconductors. The students will be directed to construct simple codes and guided in the use of the more sophisticated available computational packages.
**Prerequisite(s):** PHYS 308 or PHYS 402.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CDS 490 - Directed Study and Research**

Credits: 1-3 (RD)  
Students work under the guidance of a faculty member on an independent study or directed research project in the computational and data sciences. May be repeated in combination with CDS 491 for a total of 6 credits between the two classes.

**Prerequisite(s):** Students must be CDS majors or minors in their junior or senior year and have permission of the instructor.

**Hours of Lecture or Seminar per week:** 1-12  
**Hours of Lab or Studio per week:** 0

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**CDS 491 - Internship**

Credits: 1-3 (RD)  
On-the-job experience for CDS majors and minors working in industry and government laboratories, including summer programs. Supervision and approval of this course must be arranged with department before registering. May be repeated in combination with CDS 490 for a total of 6 credits between the two classes.

**Prerequisite(s):** Students must be CDS majors or minors in their junior or senior year and have permission of the instructor.

**Hours of Lecture or Seminar per week:** 1-9  
**Hours of Lab or Studio per week:** 0

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**Computational Sciences and Informatics (CSI)**

Offered by the College of Science

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**CSI 500 - Computational Science Tools**

Credits: 3 (NR)  
This 3-credit course introduces computer skills and packages commonly used in quantitative scientific research. It is a part of the Department of Computational and Data Sciences graduate certificate and MS programs and should be of interest to a broad range of students throughout the university, as well as professionals employed in private industry and government laboratories.

**Prerequisite(s):** 1 year of college calculus, knowledge of matrix algebra, and computer programming.

**Notes:** CSI 601 and CSI 602, including additional material, have merged to create CSI 500.

**Hours of Lecture or Seminar per week:** 3
CSI 501 - Introduction to Scientific Programming

Credits: 3 (NR)
This course introduces and reviews programming in C and FORTRAN with emphasis on the aspects used in the computational and data sciences. The course is conducted through a combination of both lecture and interactive computer laboratory.

Prerequisite(s): Permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 600 - Quantitative Foundations for Computational Sciences

Credits: 3 (NR)
Accelerated review of mathematical tools for scientific applications and analysis. Topics include vectors and matrices; differential and difference equations; linear systems; Fourier, Laplace, and Z-transforms; and probability theory.

Equivalent to SYST 500

Prerequisite(s): MATH 213 and 214.

Notes: Not applicable to 48-credit course total for CSI PhD.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 615 - Quantum Computation

Credits: 3 (NR)
Introduces field of quantum computation. Emphasizes scientific principles involved and presentation of strengths and weaknesses of approach. Topics include basic quantum physics and quantum algorithms.

Prerequisite(s): Undergraduate course in quantum physics, and undergraduate degree in physical or computer sciences, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 638 - The Policy Process for Scientists
CSI 639 - Ethics in Scientific Research

Credits: 3 (NR)
Reviews purpose of scientific research and principles for evaluating ethical issues. Teaches skills for survival through training in moral reasoning and responsible conduct. Discusses ethical issues and applying critical-thinking skills to design, execution, and analysis of experiments. Issues include using animals, humans in research; ethical standards in computer community; research fraud; and currently accepted guidelines for data ownership, manuscript preparation, and conduct of those in authority.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 654 - Data and Data Systems in the Physical Sciences

Credits: 3 (NR)
Introduces data issues associated with modern physical sciences. Examines data access, formats, browsing, analysis, visualization, and data information systems in federated environments. Uses examples from physical sciences, including astronomy and space sciences; Earth sciences; Earth observing and other fields of physics; and model output data and associated special issues. Introduces mathematical techniques particularly important for large databases.

Prerequisite(s): Competency in programming at CSI 601-607 level, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 655 - Atmospheric Physics I

Credits: 3 (NR)
Introduction to basic physical and chemical processes that operate in the Earth's atmosphere. Emphasis on those concepts that provide a global description of the current atmospheric state and those processes that relate to global change and atmospheric evolution. Topics include equilibrium structure, radiative transfer models, thermodynamics of various atmospheric layers, and the various processes defining these layers.

Equivalent to PHYS 575

Prerequisite(s): PHYS 260, 262, and 305, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CSI 659 - Dispersal Methods of Hazardous Releases

Credits: 3 (NR)
Covers physics of aerosols; engineering, mechanics of building ventilation systems; and mechanical dissemination utilizing hand-held, automatic, vehicle, and truck mounted systems. Also discusses basic concepts, theories, and models of pollutant dispersal in atmosphere, and related atmospheric systems affecting dispersal of biological agents.

Prerequisite(s): CSI 655, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 660 - Space Instrumentation and Exploration

Credits: 3 (NR)
Surveys instruments, devices, and methods for space and planetary exploration. Covers remote sensing of Earth and other solar system bodies; and planned manned and unmanned missions by the United States and other countries.

Equivalent to ASTR 535

Prerequisite(s): PHYS 262, MATH 213, or equivalent; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 661 - Stellar Astrophysics

Credits: 3 (NR)
Survey of contemporary astrophysics. Topics include physical concepts, stellar spectra, Hertzsprung-Russell diagram, stellar atmospheres, stellar structure, interstellar matter, stellar evolution, high-energy phenomena, hydrodynamical processes in astrophysics, accretion disk formation, and shock formation.

Equivalent to ASTR 730, ASTR 530 (2010-2011)

Prerequisite(s): PHYS 303, 305, 308; MATH 214.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 662 - Introduction to Space Weather

Credits: 3 (NR)
Introduction to space weather involving systems such as the sun, the heliosphere, and the Earth's magnetosphere and ionosphere. Covers the solar magnetic field, solar flares, coronal mass ejections, particle acceleration mechanisms, the solar wind, and the
Earth's magnetic field, radiation belt, geomagnetic storms, and ionospheric disturbances.

Prerequisite(s): PHYS 303, 305, 307, and MATH 213, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 670 - Economic Systems Design

Credits: 3 (NR)
Introduces analytical and engineering principles used to develop exchange systems. Covers behavioral aspects of auction systems; matching, assignment, and transportation problems; and information markets. Introduces methods for testbedding systems using experimental economics.

Prerequisite(s): Course in linear and nonlinear optimization, and course in linear algebra; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 672 - Statistical Inference

Credits: 3 (NR)
Covers critical aspects of probability, random variables and distributions, characteristic functions, stochastic convergence, optimal estimation, maximum-likelihood estimation, asymptotic theory, Bayesian methods, likelihood-ratio tests, statistical decision theory, sequential methods.

Equivalent to STAT 652

Prerequisite(s): STAT 544 with grade of B- or better, and STAT 554 with grade of B- or better.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 674 - Bayesian Inference and Decision Theory

Credits: 3 (NR)
Introduces decision theory and relationship to Bayesian statistical inference. Teaches commonalities, differences between Bayesian and frequentist approaches to statistical inference, how to approach a statistics problem from the Bayesian perspective and how to combine data with informed expert judgment in a sound way to derive useful and policy-relevant conclusions.
Teaches necessary theory to develop firm understanding of when and how to apply Bayesian and frequentist methods, and practical procedures for inference, hypothesis testing, and developing statistical models for phenomena. Teaches fundamentals of Bayesian theory of inference, including probability as a representation for degrees of belief, likelihood principle, use of Bayes Rule to revise beliefs based on evidence, conjugate prior distributions for common statistical models, and methods for approximating the posterior distribution. Introduces graphical models for constructing complex probability and decision models from modular components.

Equivalent to STAT 664/SYST 664
Prerequisite(s): STAT 544 or CSI 672, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 676 - Regression Analysis

Credits: 3 (NR)
Simple and multiple linear regression, polynomial regression, general linear models, subset selection, step-wise regression, and model selection. Also covered are multicollinearity, diagnostics, and model building. Both the theory and practice of regression analysis are covered.

Equivalent to STAT 656

Prerequisite(s): STAT 554, matrix algebra and working knowledge of SAS.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 678 - Times Series Analysis and Forecasting

Credits: 3 (NR)
Modeling stationary and nonstationary processes; autoregressive, moving average and mixed model processes; hidden periodicity models; properties of models; autocovariance and autocorrelation functions, and partial autocorrelation function; spectral density functions; identification of models; estimation of model parameters, and forecasting techniques.

Equivalent to STAT 658

Prerequisite(s): STAT 544 or CSI 672 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 685 - Fundamentals of Materials Science

Credits: 3 (NR)
Covers fundamentals of materials science with emphasis on physical topics including crystal structure and symmetry, dislocation theory, theory of interfaces, multicomponent phase diagrams, theory of phase transformations, nano-materials, metallic glasses. Includes a term project, assignments from current literature and application of computation in materials science.

Equivalent to PHYS 615

Prerequisite(s): CDS 385/PHYS 385; or undergraduate degree in physics, chemistry, materials, electrical or mechanical engineering or related disciplines; or permission of instructor.
CSI 687 - Solid State Physics and Applications

Credits: 3 (NR)
Covers crystal structures, binding, lattice vibrations, free electron model, metals, semiconductors and semiconductor devices, superconductivity, and magnetism.

Equivalent to PHYS 512

Prerequisite(s): PHYS 502 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 700 - Numerical Methods

Credits: 3 (NR)
Covers computational techniques for solving science, engineering problems. Develops algorithms to treat typical problems in applications, emphasizing types of data encountered in practice. Covers theoretical development as well as implementation, efficiency, and accuracy issues in using algorithms and interpreting results. When applicable, uses computer graphical techniques to enhance interpretation.

Equivalent to MATH 685/OR 682

Prerequisite(s): MATH 203 and 214, and some programming experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 701 - Foundations of Computational Science

Credits: 3 (NR)
Covers mapping of mathematical models to computer software, including all aspects of developing scientific software such as architecture, data structures, advanced numerical algorithms, languages, documentation, optimization, validation, verification, and software reuse. Examples in bioinformatics, computational biology, computational physics, and global change demonstrate scientific advances enabled by computation. Class projects involve working in teams to develop software that implements mathematical models, using software to address important scientific questions, and conducting computational experiments with it.

Prerequisite(s): Competency in UNIX and programming at CSI 601-604 level, and CSI 700; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CSI 702 - High-Performance Computing

Credits: 3 (NR)
Hardware and software associated with high-performance scientific computing. Computer architectures, processor design, programming paradigms, parallel and vector algorithms. Emphasizes importance of software scalability in science problems.

Prerequisite(s): CSI 700 and 701; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 703 - Scientific and Statistical Visualization

Credits: 3 (NR)
Covers visualization methods used to provide new insights and intuition concerning measurements of natural phenomena, and scientific and mathematical models. Presents case studies from myriad disciplines. Topics include human perception and cognition, introduction to graphics laboratory, elements of graphing data, representation of space-time and vector variables, representation of 3-D and higher dimensional data, dynamic graphical methods, and virtual reality. Work on a visualization project required. Emphasizes software tools on Silicon Graphics workstation, but other workstations and software may be used.

Prerequisite(s): STAT 554 or CS 551, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 709 - Topics in Computational Sciences and Informatics

Credits: 3 (RT)
Covers selected topics in computational sciences and informatics not covered in fixed-content computational sciences and informatics courses.

Prerequisite(s): Admission to PhD program, and permission of instructor.

Notes: May be repeated for credit as needed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 710 - Scientific Databases

Credits: 3 (NR)
Study of database support for scientific data management. Covers requirements and properties of scientific databases, data models for statistical and scientific databases, semantic and object-oriented modeling of application domains, statistical database query languages and query optimization, advanced logic query languages, and case studies such as the human genome project and Earth-orbiting satellites.
CSI 711 - Chemical Thermodynamics and Kinetics

Credits: 3 (NR)
Advanced study of thermodynamics and kinetics. Covers application of kinetics to elucidation of reaction mechanisms, and application of statistical thermodynamics to theory of elementary reaction rates.

Equivalent to CHEM 633

Prerequisite(s): CHEM 331 and 332.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 712 - Introduction to Solid Surfaces

Credits: 3 (NR)
Includes gas absorption isotherms, surface-area measurement techniques, real and clean surfaces, physisorption and chemisorption, methods of gas absorption and desorption, measurement of heats of adsorption, desorption kinetics, electron spectroscopies and their surface sensitivities, instrumentation needed, and principles of vacuum technology.

Equivalent to CHEM 728

Prerequisite(s): CHEM 422 or equivalent. Introduces properties of solid surfaces.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 713 - Quantum Chemistry

Credits: 3 (NR)
Illustrates fundamental concepts of quantum mechanics with applications to chemical systems, including atomic and molecular electronic structure and properties, molecular symmetry, and intermolecular forces.

Equivalent to CHEM 732

Prerequisite(s): CHEM 332.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CSI 714 - Spectroscopy and Structure

Credits: 3 (NR)
Covers quantum mechanics of the interaction of atoms and molecules with electromagnetic radiation. Also covers modern spectroscopic methods as applied to the elucidation of molecular structure and dynamics.

Prerequisite(s): CHEM 332.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 715 - Quantum Complexity Theory

Credits: 3 (NR)
Discusses fundamental aspects of complexity theory and its applications from perspective of quantum physics. Explores current research in emerging field of quantum complexity theory, and discusses related issues in quantum algorithms.

Prerequisite(s): CSI 615 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 716 - Quantum Information Theory

Credits: 3 (NR)
Introduces quantum information theory and its practical applications to information processing and secure communications. Emphasizes applications involving commercial and defense systems.

Prerequisite(s): CSI 615, and CSI 783 or 784; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 717 - Quantum Computer Programming

Credits: 3 (NR)
Covers methods for programming quantum computers. Topics include quantum computing concepts, currently known algorithms for quantum computers, denotational semantics, existing languages for quantum computers, application of logic programming to quantum computers, and programming for different types of novel computer architectures.

Prerequisite(s): CSI 615 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CSI 718 - Quantum Computer Realization

Credits: 3 (NR)
Introduces physical implementation of quantum computation, and practical applications to developing scalable quantum computers. Special emphasis on various schemes for achieving practical quantum computers.

Prerequisite(s): CSI 615, and 784 or equivalent; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 719 - Topics in Computational Chemistry

Credits: 3 (RD)
Covers selected topics in computational chemistry not covered in fixed-content computational chemistry courses.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as needed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 720 - Fluid Mechanics

Credits: 3 (NR)
Covers basic and advanced fluid mechanics and continuous hypothesis to define fluids. Introduces tensor analysis; Euclidean and Lagrangian representations of fluid flow; Laplace's equation; continuity equation; Navier-Stokes equations; Bernoulli's theorem and Crocco's form of the equations; steady and unsteady flows; potential, incompressible, and compressible flows; gravity and sound waves; gas dynamics; and viscous flows.

Prerequisite(s): CSI 700 and 780; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 721 - Computational Fluid Dynamics I

Credits: 3 (NR)
Covers fundamentals including spatial and temporal approximation techniques for partial differential equations, solution of large systems of equations, data structures, solvers of the Laplace/ full potential equation, and simple Euler solvers. Includes two major projects Laplace solver, and 2-D Euler solver on unstructured grids. Students expected to write their own codes.

Prerequisite(s): Course in partial differential equations such as MATH 678 or equivalent; knowledge of linear algebra at level of
MATH 603 or CSI 740/MATH 625; coding experience in FORTRAN or C; or permission of instructor.

**CSI 722 - Computational Fluid Dynamics II**

Credits: 3 (NR)
Covers more advanced topics in computational fluid dynamics, including high-resolution schemes for hyperbolic PDEs, advanced Euler solvers, Navier-Stokes solvers, grid generation, adaptive mesh refinement, efficient use of supercomputing hardware, and future trends. Projects include topics in grid generation and adaptive refinement. Students expected to write their own codes.

**Prerequisite(s):** CSI 721 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**CSI 723 - Fluid Mechanics II**

Credits: 3 (NR)
Covers gas dynamics, shock waves, method of characteristics, boundary layer flows, instabilities, and turbulence modeling. Special topics include biological, non-Newtonian, and free surface flows; aeroelasticity; and magneto-hydrodynamics.

**Prerequisite(s):** CSI 720 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**CSI 729 - Topics in Continuum Systems**

Credits: 3 (NR)
Covers selected topics in the computational aspects of continuum systems not covered in fixed-content courses in dynamical systems. Possible topics are smooth-particle hydrodynamics, radiation hydrodynamics, algorithms for continuum systems, adaptive grids for continuum computations, spectral methods in computational fluid dynamics, algorithms for concurrent machines, formation of high-energy particle jets in astrophysical applications, application to Earth atmospheric problems, and flow considerations in molten materials.

**Prerequisite(s):** Permission of instructor.

**Notes:** May be repeated for credit as needed.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
CSI 739 - Topics in Bioinformatics

Credits: 3 (NR)
Selected topics in bioinformatics not covered in fixed-content bioinformatics courses.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as needed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 740 - Numerical Linear Algebra

Credits: 3 (NR)
Covers computational methods for matrix systems; theory and development of numerical algorithms for the solution of linear systems of equations, including direct and iterative methods; analysis of sensitivity of system to computer round off; and solution of least squares problems using orthogonal matrices. Also covers computation of eigenvalues and eigenvectors, singular value decomposition, and applications.

Equivalent to MATH 625

Prerequisite(s): MATH 203 and some programming experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 742 - The Mathematics of the Finite Element Method

Credits: 3 (NR)
The finite element method is commonly used for developing numerical approximations to problems involving ordinary and partial differential equations. Course develops underlying mathematical foundation, examines specific types of finite elements, analyzes convergence rates and approximation properties, and uses method to solve important equations. Students develop their own codes and are expected to complete independent projects.

Prerequisite(s): MATH 446 or 685, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 744 - Linear and Nonlinear Modeling in the Natural Sciences

Credits: 3 (NR)
Develops tools of mathematical modeling while carrying out numerical simulations. Considers examples from across the sciences. Topics include basic issues such as models, simplification, linearity, and nonlinearity; dimensionless parameters; dimensional analysis; models involving differential equations; examples from population growth and chemical kinetics; models
involving partial differential equations; diffusion, transport, nonlinearity and shocks; probabilistic modeling; perturbation methods; extrapolation; and introduction to stability.

**Prerequisite(s):** Permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CSI 746 - Wavelet Theory**

Credits: 3 (NR)  
Studies theory and computational aspects of wavelets and wavelet transform. Emphasizes computational aspects of wavelets. Defines Fast Wavelet Transform in one and two dimensions, and develops appropriate numerical algorithms, and theory of wavelet bases on the real line. Covers multiresolution analysis, splines, time-frequency localization, and wavelet packets.

Equivalent to MATH 772

**Prerequisite(s):** Knowledge of convolution and Fourier transforms of sequences; some familiarity with Hilbert space theory helpful but not required; knowledge of scientific programming language.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CSI 747 - Nonlinear Optimization and Applications**

Credits: 3 (NR)  
Introduction to practical aspects of nonlinear optimization. Covers applications of optimization algorithms to solving problems in science and engineering. Applications include data analysis, materials science, nanotechnology, mechanics, optical design, shape design, and trajectory optimization.

**Prerequisite(s):** MATH 213 and 216, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CSI 749 - Topics in Computational Mathematics**

Credits: 3 (NR)  
Selected topics in computational mathematics not covered in fixed-content computational mathematics courses.

**Prerequisite(s):** Permission of instructor.

**Notes:** May be repeated for credit as needed.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
CSI 750 - Earth Systems and Global Changes

Credits: 3 (NR)
Introduces global system interactions responsible for global environmental change. Discusses natural causes of past and present global changes, and how human activities affect them; and ecological and human consequences of global changes. Topics include climate and hydrological systems, global warming, deforestation, ozone depletion, ecological system dynamics, introduction to climate and global change monitoring, satellite instrumentation and calibration, and model predictions.

Prerequisite(s): Course in ecology, environmental geology, or atmospheric physics; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 754 - Earth Science Data and Advanced Data Analysis

Credits: 3 (NR)
Covers accessing and applying Earth observations and remote-sensing data for Earth system science research and applications. Major topics are data formats, analysis and visualization tools, advanced data analysis methods, and data applications. Also covers combining innovative information technology techniques and Earth science data to set up online data centers for accessing data through the web.

Prerequisite(s): GGS 579 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 757 - Techniques and Algorithms in Earth Observing and Remote Sensing

Credits: 3 (NR)
Covers retrieval, analysis, and application of geophysical parameters derived from remotely sensed data for Earth system research and applications. Includes theory of visible and infrared and microwave remote sensing, heritage sensors, sensor calibration, retrieval algorithms, validation, and error estimates.

Equivalent to GGS 757

Prerequisite(s): CSI 753 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 758 - Visualization and Modeling of Complex Systems

Credits: 3 (NR)
Covers elements of modeling and analysis of Earth and space sciences data and systems. Concentrates on sample projects and
student-initiated projects to use visualization and graphical analysis techniques as they apply to modeling of complex data sets and systems. Uses several different analysis and visualization packages. Spacecraft data sets from the Naval Research Laboratory (NRL) Backgrounds Data Center and other NRL data sets are available for course projects; perusal of web data sets also possible. Modeling and analysis accompanied by appropriate readings from current literature.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 761 - N-Body Methods and Particle Simulations

Credits: 3 (NR)
Covers particle methods to solve variety of physical systems. Emphasizes study and development of numerical results, and visualization of these results in complex physical systems. Applications and projects include stellar and galaxy dynamics, smoothed particle hydrodynamics, plasma simulations, and semiconductor device theory algorithms on parallel and vectorized systems.

Equivalent to ASTR 761

Prerequisite(s): PHYS 613, CSI 780 and CSI 700 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 763 - Statistical Methods in Space Sciences

Credits: 3 (NR)
Covers statistical and data analysis methods applicable to problems in space science, remote sensing, and astrophysics. Includes parametric and nonparametric hypothesis testing, parameter estimation, correlation analysis, time series analysis, spatial analysis, and image reconstruction. Emphasizes imperfect nature of actual data sets and hypothesis. Examples drawn from current space science research.

Prerequisite(s): ASTR 530 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 764 - Computational Astrophysics

Credits: 3 (NR)
Covers statistical mechanics concepts important in astrophysics. Presents unified approach to particle acceleration and interaction theory based on analytical and numerical analysis of Boltzmann and Liouville equations. Discusses computational methods relevant to particle transport problems, with emphasis on Fokker-landau and Monte Carlo solution techniques. Applications from space sciences include studies of cosmic ray acceleration, photon comptonization, particle transport in the near-Earth environment, energy transport in stellar atmospheres, and self-gravitating system dynamics.
CSI 765 - High-Energy and Accretion Astrophysics

Credits: 3 (NR)
Overview of atomic and nuclear physics. Covers nuclear reactions of use to high-energy astrophysics; radiation processes in cosmic plasmas, emphasizing quantum mechanical calculations; stellar evolution and nucleosynthesis; computational models of stellar evolution; binary stars and accretion disks; numerical models of the structure of accretion disks; compact stars, white dwarfs, neutron stars, and black holes; acceleration processes and cosmic rays; interstellar medium and propagation of cosmic rays; high-energy processes in the center of galaxies; and ground- and space-based techniques and observations.

Equivalent to ASTR 765

Prerequisite(s): PHYS 502, ASTR 530, and PHYS 613/CSI 780 or permission of instructor.

CSI 766 - Relativity and Cosmology

Credits: 3 (NR)
Covers special relativity, four-dimensional space-time, general relativity, non-Euclidean geometries, geodesic and field equations, test of general relativity theory, black holes, cosmic background radiation, thermodynamic considerations in cosmology, and cosmological models.

Equivalent to ASTR 766

Prerequisite(s): ASTR 530 and MATH 314, or permission of instructor.

CSI 769 - Topics in Space Sciences

Credits: 3 (RD)
Selected topics in space sciences not covered in fixed-content space sciences courses.

Equivalent to ASTR 769

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as needed.
CSI 771 - Computational Statistics

Credits: 3 (NR)
Covers basic computationally intensive statistical methods and related methods, which would not be feasible without modern computational resources. Covers nonparametric density estimation including kernel methods, orthogonal series methods and multivariate methods, recursive methods, cross-validation, nonparametric regression, penalized smoothing splines, the jackknife and bootstrapping, computational aspects of exploratory methods including the grand tour, projection pursuit, alternating conditional expectations, and inverse regression methods.

Equivalent to STAT 751

Prerequisite(s): STAT 544, 554, and 652.

CSI 772 - Statistical Learning

Credits: 3 (NR)
The course focuses on statistical learning theory by introducing the statistical and optimization background essential for developing new efficient statistical learning algorithms. Also discusses applications of statistical learning algorithms to the solution of important problems in many areas of science.

Equivalent to STAT 772.

Prerequisite(s): STAT 652 / CSI 672, or permission of instructor.

CSI 773 - Statistical Graphics and Data Exploration

Credits: 3 (NR)
Exploratory data analysis provides a reliable alternative to classical statistical techniques, which are designed to be the best possible when stringent assumptions apply. Topics include graphical techniques such as scatter plots, box plots, parallel coordinate plots, and other graphical devices; re-expression and transformation of data; influence and leverage; and dimensionality reduction methods such as projection pursuit.

Equivalent to STAT 663

Prerequisite(s): 300-level course in statistics; STAT 554 strongly recommended.
CSI 775 - Computational Models of Probabilistic Reasoning

Credits: 3 (NR)
Introduces theory and methods for building computationally efficient software agents that reason, act, and learn environments characterized by noisy and uncertain information. Covers methods based on graphical probability and decision models. Students study approaches to representing knowledge about uncertain phenomena, and planning and acting under uncertainty. Topics include knowledge engineering, exact and approximate inference in graphical models, learning in graphical models, temporal reasoning, planning, and decision-making. Provides practical model building experience. Students apply what they learn to semester-long project of their own choosing.

Equivalent to OR 719/STAT 719

Prerequisite(s): STAT 652 or 664, or permission of instructor.

CSI 776 - Stochastic Differential Equations

Credits: 3 (NR)
Introduces modern theory of stochastic calculus. Covers stochastic integrals, martingales, counting processes, diffusion processes, and Itô-type processes in general. Considers applications of these methods to engineering, biology, and economics.

Prerequisite(s): STAT 652, ECE 630 or ECE 632 or permission of instructor.

CSI 777 - Principles of Knowledge Mining

Credits: 3 (NR)
Principles and methods for synthesizing task-oriented knowledge from computer data and prior knowledge, and presenting it in human-oriented forms such as symbolic descriptions, natural language-like representations, and graphical forms. Topics include fundamental concepts of knowledge mining; methods for target data generation and optimization; statistical and symbolic approaches; knowledge representation and visualization; and new developments such as inductive databases, knowledge generation languages, and knowledge scouts.

Prerequisite(s): INFS 614 or equivalent, or permission of instructor.
CSI 779 - Topics in Computational Statistics

Credits: 3 (RT)
Selected topics in computational statistics not covered in fixed-content computational statistics courses.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as needed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 780 - Computational Physics and Applications

Credits: 3 (NR)
Applies numerical methods to study of variety of physical systems, with emphasis on modeling and simulation. Develops numerical algorithms and simulation codes to gain understanding of mechanisms, processes in physical systems. Includes several projects drawn from such areas as atomic and molecular interactions, molecular dynamics, lattice dynamics, quantum systems, chaos, percolation, random walks, aggregation mechanisms of soft solids, nanomaterials, and nonlinear dynamics.

Equivalent to PHYS 613

Prerequisite(s): PHYS 502; FORTRAN, C, or C++ programming; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 781 - Plasma Science

Credits: 3 (NR)
Study of ionized matter, theory, and some computation with application to astrophysics, industrial plasma processing, magnetosphere, and ionosphere problems. Vlasov and fluid equations derived and applied in plasma science, including study of plasmas with and without magnetic fields.

Prerequisite(s): PHYS 513 or PHYS 722/CSI 785; PHYS 711/CSI 782/CHEM 730 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 782 - Statistical Mechanics for Modeling and Simulation

Credits: 3 (NR)
Studies microcanonical, canonical, and grand canonical ensembles and fluctuations, as well as Fermi-Dirac and Bose-Einstein statistics. Modeling of ideal, dilute, and diatomic gases, liquids, and crystals. Also covers Liouville equation and simulation in classical statistical mechanics. Introduces Brownian motion, kinetic theory, and transport processes.
Prerequisite(s): CSI 700 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSI 783 - Computational Quantum Mechanics**

Credits: 3 (NR)
Studies fundamental concepts of quantum mechanics from computational point of view, review of systems with spherically symmetric potentials, many electron atom solutions to Schrödinger's equation, electron spin in many-electron systems, atomic structure calculations, algebra of many-electron calculations, Hartree-Fock self-consistent field method, molecular structure calculations, scattering theory computations, and solid-state computations.

Equivalent to PHYS 736/CHEM 736

Prerequisite(s): PHYS 502 and PHYS 613/CSI 780, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSI 786 - Molecular Dynamics Modeling**

Credits: 3 (NR)
Introduces simulation methods in physical chemistry sciences. Covers computational approaches to modeling molecular and condensed matter systems, including interatomic and molecular potentials, molecular dynamics, time averages, ensemble distributions, numerical sampling, thermodynamic functions, response theory, transport coefficients, and dynamic structure. Includes stochastic simulations such as Brownian motion, Langevin dynamics, Monte Carlo methods and random walks, and introduction to cellular automata.

Prerequisite(s): PHYS 613/CSI 780 or CHEM 633/CSI 711, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSI 787 - Computational Materials Science**

Credits: 3 (NR)
Covers selected topics in computational aspects of condensed matter, such as methods of electronic structure calculations, surface science, molecular clusters, lattice dynamics, nanomaterials, semiconductors, superconductivity, magnetism, Hubbard model, mesoscopic systems, and liquids.

Prerequisite(s): PHYS 512/CSI 687 and PHYS 736/CSI 783, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CSI 788 - Simulation of Large-Scale Physical Systems

Credits: 3 (NR)
Study of diverse, large-scale physical systems emphasizing modeling and simulation of these multifaceted systems. Several projects are undertaken, drawn from such areas as many-body dynamics, atmospheric structure and dynamics, high-temperature plasmas, stellar structure, hydro dynamical systems, galactic structure and interactions, and cosmology.

Equivalent to PHYS 728

Prerequisite(s): PHYS 613/CSI 780 and CSI 700 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 789 - Topics in Computational Physics

Credits: 3 (NR)
Selected topics in computational physics not covered in fixed-content computational physics courses.

Equivalent to PHYS 780

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as needed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 796 - Directed Reading and Research

Credits: 1-6 (RD)
Reading and research on specific topic in computational sciences and informatics under direction of faculty member. May be repeated for a total of 6 credits.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CSI 798 - Research Project

Credits: 3 (NR)
Project chosen and completed under guidance of graduate faculty member, resulting in acceptable technical report.
Prerequisite(s): 12 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  

CSI 799 - Master's Thesis  
Credits: 1-6 (RD)  
Project chosen and completed under guidance of graduate faculty member, resulting in acceptable technical report (master's thesis) and oral defense.  

Prerequisite(s): 12 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week: 1-3  
Hours of Lab or Studio per week: 0  
Grading: Satisfactory/No credit only

CSI 819 - Quantum Information Science Topics  
Credits: 3 (RD)  
Selected topics in quantum information science not covered in fixed-content computational sciences courses.  

Prerequisite(s): Permission of instructor.

Notes: Course may be repeated for credit as needed.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

CSI 854 - Hyperspectral Imaging Applications  
Credits: 3 (NR)  
Includes advanced hyperspectral concepts, multisystems tradeoffs, data collection and processing systems, imaging radar systems, laser systems, data fusion, calibration and data compression techniques, remote sensing and U.S. national policy. Applications include environmental, homeland security, medical, military, disaster mitigation, agricultural, and transportation topics.  

Equivalent to GGS 840  

Prerequisite(s): CSI 753 or equivalent or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0
CSI 873 - Computational Learning and Discovery

Credits: 3 (NR)
Presents modern ideas, theories, and methods for computational learning and discovery, along with relevant applications including medical diagnosis, Earth science data analysis, and neuronal modeling. Includes background elucidation of fundamental concepts in computational learning, addressing discovery of equations, theory of causality, and comparison with biological and cognitive models. Students make presentations on topics of their research interest, and work on projects involving state-of-the-art systems.

Prerequisite(s): CS 580 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 876 - Measure and Linear Spaces

Credits: 3 (NR)
Covers measure theory and integration, convergence theorems, and the theory of linear spaces and functional analysis, including normed linear spaces, inner product spaces, Banach and Hilbert spaces, Sobolev spaces, and reproducing kernels. Topics include wavelets, applications to stochastic processes, and nonparametric functional inference.

Equivalent to STAT 876

Prerequisite(s): IT 776 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 877 - Geometric Methods in Statistics

Credits: 3 (NR)
Develops foundations of geometric methods for statistics. Topics include n-dimension Euclidian geometry; projective geometry; differential geometry, including curves, surfaces, and n-dimensional differentiable manifolds; and computational geometry, including computation of convex hulls, tessellations of two-, three-, and n-dimensional spaces, and finite element grid generation. Examples include applications to scientific visualization.

Equivalent to STAT 877

Prerequisite(s): STAT 751 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 885 - Atomistic Modeling of Materials
CSI 888 - Topics in Quantum Systems

Credits: 3 (NR)
Selected topics in quantum systems in physics and chemistry not covered in fixed-content courses in quantum mechanics. Possible topics are new spectroscopic methods, density functional theory, energy transfer and fluorescence, nuclear magnetic resonance, Mossbauer spectroscopy, advanced computational considerations in atomic or molecular structure, nuclear scattering theory, quantum considerations in condensed matter problems, and quantum gravity.

Prerequisite(s): PHYS 736/CSI 783 or PHYS 732/CSI 784; or permission of instructor.

Notes: May be repeated for credit as needed.

CSI 889 - Colloquium in Computational Sciences and Informatics

Credits: 1 (RT)
Presentations in a variety of areas of computational sciences and informatics by SCS faculty and staff members, and professional visitors.

Notes: May be repeated for credit, but maximum 3 credits of CSI 898, 899, and 991 may be applied to PhD.
CSI 909 - Advanced Topics in Computational Sciences and Informatics

Credits: 3 (NR)
Covers selected topics in computational sciences and informatics not covered in fixed-content courses.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as necessary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 971 - Probability Theory

Credits: 3 (NR)
A rigorous measure-theoretic treatment of probability. Includes expectation, distributions, laws of large numbers and central limit theorems for independent random variables, characteristic function convergence, and Markov chains.

Equivalent to STAT 971

Prerequisite(s): STAT 544 and MATH 315

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 972 - Mathematical Statistics I

Credits: 3 (NR)
Focuses on theory of estimation, exploring method of moments, least squares, maximum likelihood, and maximum entropy methods. Details methods of minimum variance unbiased estimation. Other topics include sufficiency and completeness of statistics, Fisher information, Cramer-Rao bounds, Bhattacharyya bounds, asymptotic consistency and distributions, statistical decision theory, minimax and Bayesian decision rules, and applications to engineering and scientific problems.

Equivalent to STAT 972

Prerequisite(s): CSI 672/STAT 652 or equivalent and either CSI 876/ IT 876/STAT 876 or IT 971/STAT 971.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 973 - Mathematical Statistics II
Concentrates on theory of hypothesis testing. Topics include characterizing the decision process; simple versus simple hypothesis tests; Neyman Pearson Lemma; and uniformly most powerful, unbiasedness, invariance, randomized, and sequential tests. Applies testing principles to situations in normal distribution family and other families of distributions.

Equivalent to STAT 973

Prerequisite(s): CSI 972.

Notes: Continuation of CSI 972.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 976 - Statistical Inference for Stochastic Processes

Credits: 3 (NR)
Covers modern theory of parameter estimation and hypothesis testing for stochastic processes, counting processes with random intensities, and solutions to stochastic differential equations driven by martingales. Considers applications to engineering, biology, and economics.

Equivalent to IT 976

Prerequisite(s): CSI 776 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 978 - Statistical Analysis of Signals

Credits: 3 (NR)
Advanced course in analysis of discrete- and continuous-time signals using methods of stochastic differential equation and time series. Presumes familiarity with methods of harmonic analysis and times series modeling. Topics include state-space modeling and eigenvalue processing, nonlinear modeling of signals, non-Gaussian stochastic process structure, detection and estimation of vector-valued signals, robust signal detection, and array processing and target tracking.

Equivalent to IT 978

Prerequisite(s): STAT 544 and 658, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSI 979 - Advanced Topics in Computational Statistics

Credits: 3 (RD)
Covers selected topics in computational statistics not covered in fixed-content computational statistics courses.
**Prerequisite(s):** Permission of instructor.

**Notes:** May be repeated for credit as needed.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CSI 986 - Advanced Topics in Large-Scale Physical Simulation**

Credits: 3 (RD)  
Covers simulation of physical systems not covered in fixed-content physical simulation courses.

**Prerequisite(s):** Permission of instructor.

**Notes:** May be repeated for credit as needed.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CSI 991 - Seminar in Scientific Computing**

Credits: 1 (RT)  
Considers selected topics in specific area of computational sciences and informatics not covered in fixed-content courses or as extension of fixed-content courses. Format for presentation is seminar with student participation.

**Notes:** May be repeated for credit, but maximum 3 credits of CSI 898, 899, and 991 may be applied to PhD.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

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**CSI 996 - Doctoral Reading and Research**

Credits: 1-6 (RD)  
Reading and research on specific topic in computational sciences and informatics under direction of faculty member. May be repeated for a total of 6 credits.

**Prerequisite(s):** Admission to doctoral program, and permission of instructor.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

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**CSI 998 - Doctoral Dissertation Proposal**

**Prerequisite(s):** Permission of advisor.

**Notes:** Course may be repeated as needed, but no more than 12 credits of CSI 998 may be applied to doctoral degree.

| Hours of Lecture or Seminar per week: | 0 |
| Hours of Lab or Studio per week:     | 0 |
| **Grading:** Satisfactory/No Credit  |   |

**CSI 999 - Doctoral Dissertation**

Credits: 1-12 (RD)
Involves doctoral dissertation research under direction of dissertation director.

**Prerequisite(s):** Admission to doctoral candidacy.

**Notes:** May be repeated as needed, but no more than 24 credits in CSI 998 and 999 may be applied to doctoral degree.

| Hours of Lecture or Seminar per week: | 0 |
| Hours of Lab or Studio per week:     | 0 |
| **Grading:** Satisfactory/No Credit  |   |

**Computational Social Science (CSS)**

Offered by the Krasnow Institute for Advanced Study

**CSS 600 - Introduction to Computational Social Science**

Credits: 3 (NR)
Graduate-level introduction to computational concepts, principles, and modeling approaches in social sciences, emphasizing simulations and elements of complexity theory as they apply to social phenomena. Survey includes systems dynamics, cellular automata, and agent-based models.

| Hours of Lecture or Seminar per week: | 3 |
| Hours of Lab or Studio per week:     | 0 |

**CSS 605 - Object-Oriented Modeling in Social Science**

Credits: 3 (NR)
Presents and applies concepts and principles from object-based modeling paradigm. Emphasizes Unified Modeling Language (UML) to render structure and operation of complex social systems and processes.
**CSS 610 - Computational Analysis of Social Complexity**

Credits: 3 (NR)
Provides hands-on examination of agent-based models in social sciences by examining and experimenting with variety of social-simulation projects conducted in modeling environments such as Swarm, Repast, Ascape, and MASON (Multi-Agent Simulator of Networks and Neighborhoods).

Prerequisite(s): CSS 600, or permission of instructor
Corequisite(s): CSS 600, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSS 620 - Origins of Social Complexity**

Credits: 3 (NR)
Examines when, where, and how social complexity emerged in human societies, emphasizing long-term analysis and comparative information processing in four civilizations of the ancient world: West Asia, East Asia, Andean Peru, and Mesoamerica.

Prerequisite(s): CSS 600 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSS 625 - Complexity Theory in the Social Sciences**

Credits: 3 (NR)
Examines social phenomena including language, terrorism, the Internet, warfare, and wealth based on power laws and far-from-equilibrium nonlinear dynamics. Emphasizes data analysis, and modeling and interpreting complexity-theoretic dynamics.

Prerequisite(s): CSS 600
Corequisite(s): CSS 600

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CSS 630 - Comparative Computational Social Science

Credits: 3 (NR)
Applies comparative method for analyzing different types of computational models in the social sciences. Strong crossdomain and interdisciplinary emphasis akin to comparative economic systems, government, or linguistics.

Prerequisite(s): CSS 600, or permission of instructor

Corequisite(s): CSS 600, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSS 635 - Cognitive Foundations of Computational Social Science

Credits: 3 (NR)
Examines cognitive foundations and information processing in computational social agents, and compares to comparable human cognitive phenomena, including emotions, trust, and reciprocity. Emphasizes modeling project.

Prerequisite(s): CSS 600 and 610, or permission of instructor

Corequisite(s): CSS 600 and 610, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSS 640 - Human and Social Evolutionary Complexity

Credits: 3 (NR)
Examines long-term evolution of human and societal complexity from global, cross-cultural perspective, emphasizing computational aspects leading to today's globalization. Global history from the computational social science perspective.

Prerequisite(s): CSS 600, 620; and permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSS 643 - Land-Use Modeling Techniques and Applications

Credits: 3 (NR)
Survey of literature on spatially explicit empirical models of land-use change. Hands-on experience developing and running simple models. Techniques include statistical models, mathematical programming models, cellular automata, agent-based models, and integrated models.

Prerequisite(s): CSS 600 or permission of instructor
Corequisite(s): CSS 600 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSS 645 - Spatial Agent-Based Models of Human-Environment Interactions**

Credits: 3 (NR)
Discusses key challenges in spatial modeling of human-environment interactions. Reviews agent-based modeling applications in urban and rural interactions, agriculture, forestry, and other areas. Hand-on development of simple ABM models. Investigates linkages between GIS and ABM.

Prerequisite(s): GGS 631 or CSS 600, or permission of instructor

Corequisite(s): GGS 631 or CSS 600, or permission of instructor

Notes: CSS 600 may be taken concurrently.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSS 650 - Physics Methods for Analyzing Social Complexity**

Credits: 3 (NR)
Surveys complexity theoretic tools including strange attractors, Ising models, correlation functions, ergodic theory, power spectra, meanfield theory, and renormalization group. Emphasizes application to social, economic, or political systems.

Prerequisite(s): CSS 600, and permission of instructor

Corequisite(s): CSS 600, and permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSS 655 - Social Systems Dynamics**

Credits: 3 (NR)
Introduces systems dynamics modeling of social systems governed by levels/rates or stocks/flows processes, with applications to global modeling, terrorism, urban dynamics, organizations, and social and international conflict.

Prerequisite(s): CSS 600

Corequisite(s): CSS 600

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CSS 660 - Computational Social Science of Spacefaring Civilization

Credits: 3 (NR)
Focuses on goals, resources, history, and modeling issues concerning human and social dimensions of space program using CSS. Design and development of socially viable human communities in extreme environments.

Prerequisite(s): CSS 600 and 610, and permission of instructor

Corequisite(s): CSS 600 and 610, and permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSS 692 - Social Network Analysis

Credits: 3 (NR)
Methods and applications that examine complex social systems based on relations, structures, connectivity, matrix representations, location, roles, interactions, and other network properties. Applications to terrorism, cognition, organizations, and other social phenomena.

Prerequisite(s): CSS 600

Corequisite(s): CSS 600

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSS 739 - Topics in Computational Social Science

Credits: 3 (RD)
Selected topics in computational social science not covered in fixed-content computational social science courses.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as needed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSS 796 - Directed Reading and Research

Credits: 3 (RD)
Reading and research on specific topic in computational social science under direction of a faculty member.
Prerequisite(s): Permission of instructor.

Notes: May be repeated as necessary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CSS 798 - Research Project**

Credits: 3 (RD)
Project chosen and completed under guidance of graduate faculty member, resulting in acceptable technical report.

Prerequisite(s): 12 graduate credits from core requirements, and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

**CSS 898 - Research Colloquium in Computational Social Science**

Credits: 1 (RD)
Presentations in specific research areas in computational social science by Center for Social Complexity-associated faculty and professional visitors.

Notes: May be repeated for credit, but maximum 3 credits of CSS 898 and 899 may be applied toward PhD.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

**CSS 899 - Colloquium in Computational Social Science**

Credits: 1 (RD)
Presentations in variety of areas of computational social science by Center for Social Complexity-associated faculty and professional visitors.

Notes: May be repeated for credit, but maximum 3 credits of CSS 898 and 899 may be applied toward PhD.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**CSS 909 - Advanced Topics in Computational Social Science**

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CSS 993 - Doctoral Readings and Research

Credits: 3 (RD)
Covers selected topics in computational social science and socioinformatics not covered in fixed-content courses.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as necessary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CSS 996 - Doctoral Reading and Research

Credits: 1-12 (RD)
Reading and research on specific topic in computational social science under direction of faculty member.

Prerequisite(s): Admission to doctoral program, and permission of instructor.

Notes: May be repeated as necessary.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CSS 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Covers development of research proposal, which forms basis for doctoral dissertation, under guidance of dissertation director and doctoral committee.

Prerequisite(s): Permission of advisor.

Notes: Candidates must complete a combined minimum of 12 credits of doctoral proposal (CSS 998) and doctoral dissertation research (CSS 999), of which at least three credits must be of CSS 999. A combined maximum of 24 credits of CSS 998 and CSS 999 may be applied to the degree.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/IP

CSS 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral dissertation research under direction of dissertation director.

Prerequisite(s): Approval of dissertation proposal.

Notes: Candidates must complete a combined minimum of 12 credits of doctoral proposal (CSS 998) and doctoral dissertation research (CSS 999), of which at least three credits must be of CSS 999. A combined maximum of 24 credits of CSS 998 and CSS
999 may be applied to the degree.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/IP

Computer Forensics (CFRS)

Offered by the Volgenau School of Engineering

CFRS 500 - Introduction to Technologies of Forensics Value

Credits: 3 (NR)
Presents an overview of technologies of interest to forensics examiners. It will provide an introduction to operating systems, software, and hardware, and other aspects required for forensics examination.

Prerequisite(s): Graduate standing

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CFRS 510 - Digital Forensics Analysis

Credits: 3 (NR)
Explains Computer Forensics crime scene procedures, beginning with initial walk-through and evaluation; identification and collection of potential evidence; preparation of intrusion investigation; aspects of working with investigators and attorneys; reverse engineering with file identification and profiling; application of critical thinking in determination of significance of artifacts; and analysis and reporting of evidence.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

CFRS 590 - Special Topics in Computer Forensics

Credits: 3 (RD)
Presents selected topics from recent developments and applications in various computer forensics disciplines. The course is designed to help the professional computer forensics community keep abreast of current developments, and to provide an applications-oriented introduction to emerging areas of computer forensics.

Prerequisite(s): Graduate standing or permission from department.
Notes: Repeatable for credit within the degree.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0

CFRS 660 - Network Forensics

Credits: 3 (NR)
Deals with the collection, preservation, and analysis of network-generated digital evidence such that the evidence can be successfully presented in a court of law (both civil and criminal). The relevant federal laws will be examined as well as private sector applications. The capture/intercept of digital evidence, the analysis of audit trails, the recording of running processes, and the reporting of such information will be examined.

Equivalent to TCOM 660

Prerequisite(s): TCOM 509 and TCOM 529 and a working knowledge of computer programming.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CFRS 661 - Digital Media Forensics

Credits: 3 (NR)
This course deals with the collection, preservation, and analysis of digital media such that the evidence can be successfully presented in a court of law (both civil and criminal). The relevant federal laws will be examined as well as private sector applications. The seizure, preservation, and analysis of digital media will be examined in this course.

Equivalent to TCOM 661

Prerequisite(s): TCOM 548 and TCOM 556 or TCOM 562; a working knowledge of computer operating systems (e.g. CS 471 or equivalent) or permission from instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CFRS 663 - Operations of Intrusion Detection for Forensics

Credits: 3 (NR)
Introduces students to network and computer intrusion detection and its relation to forensics. It addresses intrusion detection architecture, system types, packet analysis, and products. It also presents advanced intrusion detection topics such as intrusion prevention and active response, decoy systems, alert correlation, data mining, and proactive forensics.

Equivalent to TCOM 663

Prerequisite(s): TCOM 509 and TCOM 529 and a working knowledge of computer programming.
**CFRS 664 - Incident Response Forensics**

Credits: 3 (NR)

This course addresses incident detection, response, and those aspects of computer forensics pertinent to the investigation of trade secret theft, economic espionage, copyright infringement, piracy, and fraud. Procedures for gathering, preserving, and analyzing forensic evidence are discussed in detail and are applied to both computer and network incident response forensics.

Equivalent to TCOM 664

**Prerequisite(s):** TCOM 509 and TCOM 529.

**CFRS 698 - Independent Reading and Research**

Credits: 1-3 (RD)

Studies selected area in Computer Forensics under the supervision of a faculty member. A written report is required.

**Prerequisite(s):** Graduate standing; completion of at least two core courses in the CFRS program; and permission of instructor

**Notes:** No more than a total of six credits may be taken from a combination of CFRS 698 and CFRS 798 for credit within the CFRS program.

**Hours of Lecture or Seminar per week:** 1-3

**Hours of Lab or Studio per week:** 0

**When Offered:** Fall, Spring, Summer

**CFRS 760 - Legal and Ethical Issues in IT**

Credits: 3 (NR)

Presents legal and ethics topics in the context of computer forensics. It will include legal principles, types of crimes, witness testimony, and forensics report writing.

**Prerequisite(s):** CFRS 500

**Hours of Lecture or Seminar per week:** 3

**Hours of Lab or Studio per week:** 0
**CFRS 761 - Malware Reverse Engineering**

Credits: 3 (NR)
Reviews disassembled code for potentially malicious binary, or piece of malware, in order to gain a better understanding of how a binary functions when executed. Analyzes behavioral aspects as they are executed in a controlled environment. Environment changes (file, system, network, process, etc.), network communications, communications with remote devices, and so on, are closely observed for actionable information.

Prerequisite(s): CFRS 500 or ISA 564.

Notes: Course will consist of exercises conducted in a lab environment with concurrent lectures (combined total of 3 credits for lab and lecture exercises).

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring.

**CFRS 762 - Mobile Device Forensics**

Credits: 3 (NR)
Reviews forensic evidence contained within mobile devices, including address books, call logs, text messages, video files, audio files, and Internet history. Discusses procedures and technologies associated with mobile devices and how such procedures differ from traditional computer forensics. Analyzes collected data and correlates information with data from carriers. Hands-on exercises included.

Prerequisite(s): CFRS 500, CFRS 661.

Notes: Course will consist of exercises conducted in a lab environment with concurrent lectures (combined total of 3 credits for lab and lecture exercises).

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring.

**CFRS 770 - Fraud and Forensics in Accounting**

Credits: 3 (NR)
Prepares students to undertake forensic accounting, a specialty practice area of accounting, in such a way that they will develop the necessary expertise, and be prepared to give expert evidence in any resultant trial.

Prerequisite(s): CFRS 500

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**CFRS 780 - Advanced Topics in Computer Forensics**
Credits: 3 (RT)
Teaches advanced topics from recent developments and applications in various areas of computer forensics. The advanced topics are chosen in such a way that they do not duplicate existing CFRS courses. Active participation of the students is encouraged in the form of writing and presenting papers in various research areas of the advanced topic. The course is designed to enhance the professional engineering community's understanding of breakthrough developments in specific areas of computer forensics.

Prerequisite(s): Permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CFRS 790 - Advanced Computer Forensics

Credits: 3 (NR)
Provides the capstone course for the MS in Computer Forensics program. CFRS 790 will integrate the concepts and practices developed within the Computer Forensics Program. Students will be exposed to case studies and be required to conduct computer forensic investigations of digital media, intercepted packet switched data, and multisource log information to successfully complete each case study.

Prerequisite(s): CFRS 660, CFRS 661, and CFRS 663; minimum of 18 credits completed in the MS in Computer Forensics Program prior to registration.

Notes: To be taken in the last year prior to the completion of degree requirement.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CFRS 798 - Research Project

Credits: 1-3 (RD)
Conduct a research project to be chosen and completed under guidance of a graduate faculty member that results in an acceptable technical report.

Prerequisite(s): Graduate standing; completion of at least two core courses and a minimum of 12 credits in the CFRS program; permission of instructor.

Notes: No more than a total of six credits may be taken from a combination of CFRS 698 and CFRS 798 for credit within the CFRS program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

Computer Game Design (GAME)

Offered by the College of Visual and Performing Arts
GAME 101 - Introduction to Game Design

Credits: 3 (NR)
Introductory overview of the game development process with an emphasis on game design. Through detailed study of historical and current games, students will learn the language and structure needed to develop their own game ideas. Students will learn the many aspects of a game development team and how each of these roles contributes to a game's overall design.

Fulfills general education requirement in arts.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GAME 210 - Basic Game Design

Credits: 3 (NR)
Introduction to computer game design and development including a brief history of the field, and current industry practice and production. Current major game design software, hardware and associated tools are explored through simple game design projects.

Prerequisite(s): CS 105 or equivalent ethics course

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GAME 230 - History of Computer Game Design

Credits: 3 (NR)
History of computer game design including games as a new medium for education, entertainment, and communications. Aspects of the business of computer game publishing, game criticism, storytelling, interactive fiction, violence, and virtual communities will be explored.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GAME 231 - Computer Animation for Games

Credits: 3 (NR)
2D and 3D modeling, character design, and animation projects are constructed using commercial and proprietary software and game design tool kits and engines. Simple texturing and models rigging for game animation will be discussed.

Prerequisite(s): GAME 210 and GAME 230.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GAME 232 - Online and Mobile Gaming

Credits: 3 (NR)
Class covers the history, practice, and design of online and mobile games. Class will discuss the current state of the smartphone applications, and study the best practices to be successful in the applications market. Students will learn the development process for smartphone applications and develop original and innovative applications in a team-based environment.

Prerequisite(s): GAME 210 and GAME 230.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GAME 250 - Music for Film and Video

Credits: 3 (NR)
Selection, editing, processing, and integration of sounds and music (post-production) for film, video, and animation. Time, frequency, and amplitude domain digital post-production techniques will be studied.

Prerequisite(s): MUSI 100 and 101

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GAME 310 - Game Design Studio

Credits: 3 (NR)
Studio course that focuses on team-based game design. In collaboration with undergraduate students from VSITE's CS game design concentration, student teams design and develop complete computer-based and online serious and/or entertainment games.

Prerequisite(s): GAME 231, GAME 250, CS 112 and PSYC 100.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GAME 330 - Computer Game Platform Analysis

Credits: 3 (NR)
Current and prototype consumer gaming platforms and consoles. Analysis will include conversion, transposition, and porting game media among most commercially produced platforms for analysis and comparisons.

Prerequisite(s): GAME 231, GAME 232, CS 112 and PSYC 100.

Corequisite(s): GAME 331.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GAME 331 - Consumer Gaming Platform Analysis Lab

Credits: 1 (NR)
Current and prototype consumer gaming platforms and consoles. Analysis will include conversion, transposition, and porting game media among most commercially produced platforms for analysis and comparisons.

Prerequisite(s): GAME 231, GAME 232, CS 112 and PSYC 100.

Corequisite(s): GAME 330.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall

GAME 332 - Story Design for Computer Games

Credits: 3 (NR)
Use of narrative structure and new media for designing computer game scenarios and stories. Traditional narrative techniques (text stories, novels, films) will be examined, as well as translations of the traditional to interactive, non-linear modes of communications. Analysis of current computer game story design theories, philosophies, and techniques will be covered.

Fulfills writing intensive requirement in the major.

Prerequisite(s): GAME 210 and 230.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GAME 367 - Writing and Editing Music and Sound

Credits: 3 (NR)
Composition, editing, processing, and integration of voice, environmental sounds and music into non-linear computer game environments. Special emphasis will be placed on HD sound and music post-production and mixing (3 & 5 transducer point listening spaces), sequential composition and sample-splicing techniques, and the study of competing compression algorithms for sound and music.

Prerequisite(s): GAME 250 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GAME 398 - Advanced Game Design Animation
Advanced 2D and 3D animation projects for interactive game scenes and scenarios are built using commercial and proprietary software and game design tool kits. Advanced texturing, rigging, lighting, and perspective manipulation will be covered.

**Prerequisite(s):** GAME 231 Prerequisite enforced by registration system.

**GAME 399 - Special Topics**

Credits: 1-4 (RT)
In-depth presentation and exploration of topical studies in computer game design. Subject matter varies.

**Notes:** May be repeated for a maximum of 12 credits when taken under different topics.

**GAME 400 - Game Design Practicum**

Credits: 3 (NR)
Studio/lecture course focuses on the design strengths and weaknesses inherent in current entertainment and serious games. UI design, level design and map structure, scoring stratum, on-line support, game ecologies, gaming communities, and designing/writing documentation and specifications will be studied.

**Prerequisite(s):** GAME 330, 367 or 398. Must be a Computer Game Design minor.

**GAME 410 - Advanced Game Design Studio**

Credits: 3 (NR)
In collaboration with undergraduate students from VSITE's CS game design concentration, student teams design and develop complete computer-based and online serious and entertainment games.

**Prerequisite(s):** GAME 310, GAME 330 and GAME 331.

**GAME 489 - Pre-Internship Seminar**
Student prepares for interview and application processes associated with securing an internship, finishing the course with a professional resume and portfolio ready for submission to potential employers.

**GAME 490 - Senior Project**

Credits: 2-6 (RD)
Student develops a case study of a publicly or commercially published computer game exploring the technical, economic, ethical, social and political ramifications on its intended target market. A public lecture of the case study is required.

**Prerequisite(s):** Completion of 60 credits in major. Students must be granted permission by the program director to take the course.

**Notes:** Restricted to GAME majors. Students must be granted permission by the program director to take the course. Students are required to complete 6 credits for the degree program.

**GAME 491 - Internship**

Credits: 3 (NR)
Placement in an appropriate internship within a program approved by a federal, state or commercial game design/publishing agency or firm.

**Prerequisite(s):** Completion of 60 credits in major

**Notes:** 180 hours of internship on-site work must be completed

**GAME 492 - Independent Study**

Credits: 1-6 (RD)
Advanced research, computer game design, or exploration of topical studies in computer game design.

**Notes:** May be repeated for a maximum of 12 credits
Computer Science (CS)

Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.

CS 101 - Preview of Computer Science

Credits: 2 (NR)
Offers a broad overview of computer science designed to provide students with an introduction to the field of computer science and an orientation to the Computer Science Department and the computing environment at the university. Includes a project to introduce problem solving using computers.

Corequisite(s): CS 112.

Notes: All computer science majors are required to take this course within their first year.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

CS 105 - Computer Ethics and Society

Credits: 1 (NR)
Intensive introduction to legal, social, and ethical issues surrounding software development and computer use. Stresses professional conduct, social responsibility, and rigorous standards for software testing and reliability. Examines issues such as liability, ownership of information, and computer crime.

Fulfills general education requirement in information technology (ethics only).

Prerequisite(s): 12 credits of undergraduate course work.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

CS 112 - Introduction to Computer Programming

Credits: 4 (NR)
Introduces the use of computer programming as a problem-solving tool. Topics in procedural programming include expressions, control structures, simple data types, input/output, graphical interfaces, testing, debugging, and programming environments.

Fulfills general education requirement in information technology (all except ethics).

Prerequisite(s): C or better in MATH 104 or MATH 105 or specified score on math placement test, or MATH 113 with a C or
CS 123 - Computing: From the Abacus to the Web

Credits: 3 (NR)
This course will give students the ability to relate to existing and emerging technologies (such as e-mail, the Internet, search engines, blogs, computer games, and robotics) by educating them on the underlying computer science concepts. Historical, social, and technical issues related to each topic will be discussed.

Notes: Students may not take this course for credit once they have successfully completed CS 211. Intended for nonmajors.

CS 211 - Object-Oriented Programming

Credits: 3 (NR)
This course continues to focus on problem solving, testing, and debugging and introduces object-oriented programming. Topics include classes, inheritance, packages, collections, exceptions, and polymorphism. Examples in the course may include the use of basic data structures.

Prerequisite(s): Grade of C or better in CS 112. Prerequisite enforced by registration system.

CS 222 - Computer Programming for Engineers

Credits: 3 (NR)
A second course in computer programming. Introduces object-oriented programming and elementary data structures. The emphasis is on problems and language features relevant to engineers.

Prerequisite(s): Grade of C or better in CS 112. Prerequisite enforced by registration system.

Notes: Intended as terminal course in computer programming.

CS 225 - Culture and Theory of Games
Explores the theory, history, culture, and lore of games with particular emphasis on the varieties of computer game environments.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**CS 261 - Introduction to a Second Language**

Credits: 1 (NR)  
Advanced programming using Java programming language. Other languages may be offered at times.

**Prerequisite(s):** Grade of C or better in CS 211.

**Notes:** Not available for credit for CS majors.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**CS 262 - Introduction to Low-Level Programming**

Credits: 1 (NR)  
Introduction to the language C, as well as operating system concepts, in UNIX, to prepare students for topics in systems programming.

**Prerequisite(s):** Grade of C or better in CS 211 or CS 222. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**CS 306 - Synthesis of Ethics and Law for the Computing Professional**

Credits: 3 (NR)  
Practical course to become effective computer professional. Examines legal and ethical issues surrounding computer technology and its use, as well as the foundation building that is necessary to deal with those challenges. Applies philosophical bases for ethical decision making to modern concerns raised by computers and technology. Addresses topics covered by CS 105 in a more intensive manner and focuses on the emerging legal and ethical issues involved in e-commerce and widespread use of the Internet.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** CS 105, junior standing (at least 60 credit hours). Prerequisite enforced by registration system.

**Corequisite(s):** All required general education courses.

**Notes:** Computer science majors may use this course to satisfy the general education synthesis requirement, so long as they have
not previously taken CS 305 for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 310 - Data Structures

Credits: 3 (NR)
Focuses on object-oriented programming with an emphasis on tools and techniques for developing moderate to large programs. Topics include use and implementation of linear and nonlinear data structures, and the design and analysis of elementary algorithms.

Prerequisite(s): Grade of C or better in CS 211 and MATH 113. Prerequisite enforced by registration system.

Corequisite(s): CS 105.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 321 - Software Requirements and Design Modeling

Credits: 3 (NR)
An introduction to concepts, methods, and tools for the creation of large-scale software systems. Methods, tools, notations, and validation techniques to analyze, specify, prototype, and maintain software requirements. Introduction to object-oriented requirements modeling, including use of case modeling, static modeling, and dynamic modeling using the Unified Modeling Language (UML) notation. Concepts and methods for the design of large-scale software systems. Fundamental design concepts and design notations are introduced. A study of object-oriented analysis and design modeling using the UML notation. Students participate in a group project on software requirements, specification, and object-oriented software design.

Fulfills writing intensive requirement in the major.

Equivalent to SWE 321 (2011-2012 Catalog); CS 421 (2010-2011 Catalog)

Prerequisite(s): Grade of C or better in CS 211. Students who have received credit for CS 421 or SWE 421 may not take CS 321. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 325 - Introduction to Game Design

Credits: 3 (NR)
Game design, in various electronic entertainment technologies, involves a diverse set of skills and backgrounds from narrative and art to computer programming. Surveys the technical aspects of the field, with an emphasis on programming.

Prerequisite(s): Grade of C or better in CS 211. Prerequisite enforced by registration system.
CS 330 - Formal Methods and Models

Credits: 3 (NR)
Abstract concepts that underlie much advanced work in computer science, with major emphasis on formal languages, models of computation, logic, and proof strategies.

Prerequisite(s): Grade of C or better in CS 211 and MATH 125. Prerequisite enforced by registration system.

CS 332 - Object-Oriented Software Design and Implementation

Credits: 3 (NR)
In-depth study of software design and implementation using a modern, object-oriented language with support for graphical user interfaces and complex data structures. Topics covered will be specifications, design patterns, and abstraction techniques, including typing, access control, inheritance, and polymorphism. Students will learn the proper engineering use of techniques such as information hiding, classes, objects, inheritance, exception handling, event-based systems, and concurrency.

Equivalent to SWE 332

Prerequisite(s): Grade of C or better in CS 211. Prerequisite enforced by registration system.

CS 351 - Visual Computing

Credits: 3 (NR)
The focus of this course is programming essential mathematical and geometric concepts underlying computer graphics. It covers fundamental topics in computational geometry, 3D modeling, graphics algorithms, and graphical user interfaces using both 2D and 3D implementations. Furthermore, it reinforces object oriented programming practices.

Prerequisite(s): C or better in CS 262 and CS 310. Prerequisite enforced by registration system.

CS 363 - Comparative Programming Languages
Key programming mechanisms described independently of particular machines or languages including control, binding, procedural abstraction, and types. Systematically surveys diverse high-level language capabilities.

**Prerequisite(s):** Grade of C or better in CS 262. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CS 367 - Computer Systems and Programming**

Credits: 3 (NR)  
Introduces students to computer systems from the perspective of a programmer. Topics covered include data representation, assembly and machine-level representation of high-level language programs, the memory hierarchy, linking, exceptions, interrupts, processes and signals, virtual memory, and system-level I/O. This course serves as a foundation for courses on compilers, networks, operating systems, and computer architecture, where a deeper understanding of systems-level issues is required.

**Prerequisite(s):** Grade of C or better in CS 262 or 222 and ECE 301 or 331. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CS 391 - Advanced Programming Lab**

Credits: 1 (RD)  
Programming-intensive lab course. Students refine problem-solving and programming skills while gaining experience in teamwork. Focuses on data structures, recursion, backtracking, dynamic programming, and debugging. Central focus is applying familiar and new algorithms and data structures to novel circumstances.

**Corequisite(s):** Grade of C or better in CS 310 and permission of instructor.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 1

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**CS 425 - Game Programming I**

Credits: 3 (NR)  
The course will provide an introduction to technologies and techniques used in modern computer games. Teams will explore the various facets of a complete design, using sophisticated tools. The course will involve a project in which a game is prototyped; this prototype and initial design will serve as the starting point for the project in CS 426.

**Prerequisite(s):** Grade of C or better in CS 310, CS 325 and CS 351. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
CS 426 - Game Programming II

Credits: 3 (NR)
This project-oriented course is a continuation of CS 425 with an emphasis on the implementation of a complete game.

Prerequisite(s): Grade of C or better in CS 425. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 440 - Language Processors and Programming Environments

Credits: 3 (NR)
Survey of basic programming language processors and software development tools such as assemblers, interpreters, and compilers. Topics include design and construction of language processors, formal syntactic definition methods, parsing techniques, and code-generation techniques.

Prerequisite(s): Grade of C or better in CS 310, 330, and 367. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 444 - Introduction to Computational Biology

Credits: 3 (NR)
This course introduces students to computational methods in molecular biology. The course will cover a broad array of topics in bioinformatics and computational biology and will be organized as three four-week modules. The modules are intended to capture the current classification of bioinformatics and computational biology methods and so to provide students with a broad view of the field.

Prerequisite(s): C or better in CS 310.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 445 - Computational Methods for Genomics

Credits: 3 (NR)
Fundamental principles and techniques for implementing computational algorithms to solve problems in biology arising from the need to process large volumes of genomic information. Topics include sequence analysis, alignment, and assembly, gene prediction, and knowledge-based protein structure prediction. Projects involve designing and programming basic alignment and prediction methods.

Prerequisite(s): C or better in CS 310 and STAT 344.
CS 450 - Database Concepts

Credits: 3 (NR)
This course covers basics to intermediate knowledge for the design, implementation, and use of relational database systems. The main topics include the Entity-Relationship (ER) and Entity-Enhanced Relationship (EER) models for database design, Relational Algebra (RA), Structured Query Language (SQL), SQL programming techniques, functional dependencies and normalization, object and object-relational databases, and security. Students will practice to design, develop, and implement a relational ORACLE database and use the database for queries, transaction processing, and report generation.

Prerequisite(s): Grade of C or better in CS 310 and 330. Prerequisite enforced by registration system.

CS 451 - Computer Graphics

Credits: 3 (NR)
Basic graphics principles and programming. Topics include scan conversion, transformation, viewing, lighting, blending, texture mapping, and some advanced graphics techniques.

Prerequisite(s): Grade of C or better in MATH 203, CS 310, and CS 367. Prerequisite enforced by registration system.

CS 455 - Computer Communications and Networking

Credits: 3 (NR)
Data communications and networking protocols, with study organized to follow layers of Internet Protocol Suite (TCP/IP family of protocols). Topics include role of various media and software components, local and wide area network protocols, network performance, and emerging advanced commercial technologies.

Prerequisite(s): Grade of C or better in CS 310 and 367, and STAT 344. Prerequisite enforced by registration system.

CS 463 - Comparative Programming Languages
Key programming mechanisms described independently of particular machines or languages, including control, binding, procedural abstraction, types, and concurrency. Includes basic programming competence in several different types of programming languages, including a language that provides concurrency.

**Prerequisite(s):** C or better in CS 330 and CS 367. Prerequisite enforced by registration system.

**Notes:** Students who have taken CS 363 may not receive credit for CS 463.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**CS 465 - Computer Systems Architecture**

Credits: 3 (NR)  
Computer subsystems and instruction set architectures. Single-cycle, multiple-cycle, and pipeline architectures. Memory hierarchy, cache, and virtual memory input-output processing.

**Prerequisite(s):** Grade of C or better in CS 367. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**CS 468 - Secure Programming and Systems**

Credits: 3 (NR)  
Fundamental principles and techniques for implementing secure computer systems. Topics include security and cryptography basics, vulnerability analysis, secure software development, and distributed system security. Projects involve designing and programming basic security tools, secure programs, and distributed systems.

**Prerequisite(s):** Grade of C or better in CS 310 and CS 367. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**CS 469 - Security Engineering**

Credits: 3 (NR)  
Modern enterprise computers are constantly under attack. A number of devices and subsystems are deployed in the enterprise defense. Course covers the software subsystems that are involved in defending computer systems. We cover threats and a plethora of architecting solutions against them including but not limited to access control and identity management, network and system security, intrusion detection and recovery systems, monitoring and forensic systems.

**Prerequisite(s):** C or better in CS 330, CS 367, and STAT 344. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
CS 471 - Operating Systems

Credits: 3 (NR)
Issues in multiprogramming. Covers concurrent processes and synchronization mechanisms; processor scheduling; memory, file, I/O, and deadlock management; performance of operating systems; and projects dealing with synchronization in multiprogrammed OS and virtual memory management.

Prerequisite(s): Grade of C or better in CS 310 and 367. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 475 - Concurrent and Distributed Systems

Credits: 3 (NR)
Practical issues in designing and implementing concurrent and distributed software. Topics include concurrent programming, synchronization, multithreading, local and wide-area network protocols, distributed computation, systems integration, and techniques for expressing coarsegrained parallelism at the application level. Projects involve network programming at application level.

Prerequisite(s): Grade of C or better in CS 310 and 367. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 480 - Introduction to Artificial Intelligence

Credits: 3 (NR)
Principles and methods for knowledge representation, reasoning, learning, problem solving, planning, heuristic search, and natural language processing and their application to building intelligent systems in a variety of domains. Uses LISP, PROLOG, or expert system programming language.

Prerequisite(s): Grade of C or better in CS 310 and 330. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 482 - Computer Vision

Credits: 3 (NR)
Basic principles of visual perception and their implementation on computer systems. Topics include early visual processing, edge detection, segmentation, intrinsic images, image modeling, representation of visual knowledge, and image understanding. Students complete projects involving real images.
Prerequisite(s): Grade of C or better in CS 310, MATH 203 and STAT 344. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 483 - Analysis of Algorithms

Credits: 3 (NR)
Analyzes computational resources for important problem types by alternative algorithms and their associated data structures, using mathematically rigorous techniques. Specific algorithms analyzed and improved.

Prerequisite(s): Grade of C or better in CS 310, CS 330 and MATH 125. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 484 - Data Mining

Credits: 3 (NR)
Basic principles and methods for data analysis and knowledge discovery. Emphasizes developing basic skills for modeling and prediction, on one side, and performance evaluation, on the other. Topics include system design; data quality, preprocessing, and association; event classification; clustering; biometrics; business intelligence; and mining complex types of data.

Prerequisite(s): Grade of C or better in CS 310 and STAT 344. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 485 - Autonomous Robotics

Credits: 3 (NR)
Covers various basic software topics in autonomous robotics, including autonomous architectures, elementary kinematics and controls, simulation, localization and mapping, reasoning, and multiagent environments. The course will have several projects involving physical robots.

Prerequisite(s): CS 262, CS 310, MATH 203 or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 490 - Design Exhibition

Credits: 3 (RD)
Capstone course focusing on design and successful implementation of major software project, encompassing broad spectrum of
knowledge and skills, developed by team of students. Requires final exhibition to faculty-industry panel.

**Prerequisite(s):** Grade of C or better in CS 321, CS 483; two other CS 400-level courses; and senior standing. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**CS 498 - Independent Study in Computer Science**

Credits: 1-3 (RT)  
Research and analysis of selected problems or topics in computer science. Topic must be arranged with instructor and approved by department chair before registering.

**Prerequisite(s):** 60 credits, major in computer science, and permission of instructor.

**Notes:** May be repeated for maximum 6 credits if topics substantially different.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

**CS 499 - Special Topics in Computer Science**

Credits: 3 (RT)  
Topics of special interest to undergraduates.

**Prerequisite(s):** 60 credits and permission of instructor; specific prerequisites vary with nature of topic.

**Notes:** May be repeated for maximum 6 credits if topics substantially different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**CS 540 - Language Processors**

Credits: 3 (NR)  
Basic programming language processors such as assemblers, interpreters, and compilers. Topics include design and construction of language processors, formal syntactic definition methods, parsing techniques, and code generation techniques. Lab includes construction of language processors, and experience with programming environments.

**Prerequisite(s):** MATH 125; and CS 310, 330, and 465

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
CS 550 - Database Systems

Credits: 3 (NR)
An introduction to database management with focus on architecting databases and using them in applications. Topics to be covered include: data modeling with the Entity-Relationship model, the relational data model and its formal languages, SQL, the theory of database design, object databases, XML and Web data.

Prerequisite(s): CS 310, 330.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 551 - Computer Graphics

Credits: 3 (NR)
Graphics principles and programming. Topics include graphics hardware, antialiasing, transformations, viewing, illumination, blending, texture mapping, color models, curves, surfaces, and animation.

Equivalent to CS 652 (2011-2012 Catalog)

Prerequisite(s): CS 310 and CS 367.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CS 555 - Computer Communications and Networking

Credits: 3 (NR)
Techniques and systems for communication of data between computational devices and layers of Internet Protocol Suite. Topics include role of various media and software components, local and wide area network protocols, network design, performance and cost considerations, and emerging advanced commercial technologies. Emphasizes TCP/IP family of protocols.

Prerequisite(s): CS 310 and CS 367 and STAT 344, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 571 - Operating Systems

Credits: 3 (NR)
Models of operating systems. Major functions including processes, memory management, I/O, interprocess communication, files, directories, shells, distributed systems, performance, and user interface.

Prerequisite(s): CS 310 and CS 367 and CS 465, or equivalent.
CS 580 - Introduction to Artificial Intelligence

Credits: 3 (NR)
Principles and methods for knowledge representation, reasoning, learning, problem solving, planning, heuristic search, and natural language processing and their application to building intelligent systems in a variety of domains. LISP, PROLOG, or expert system programming language.

Prerequisite(s): CS 310 and 330.

CS 583 - Analysis of Algorithms

Credits: 3 (NR)
Topics include analyzing sequential and parallel algorithmic strategies such as greedy methods, divide and conquer strategies, dynamic programming, search and traversal techniques, and approximation algorithms; and analyzing specific algorithms falling into these classes, NP-Hard and NP-Complete problems.

Prerequisite(s): CS 310 and 330, and MATH 125.

CS 600 - Theory of Computation

Credits: 3 (NR)
Introduction to logic and proof techniques, formal languages, automata theory, and computational complexity. Specific topics include regular and context-free languages, Turing machines, NP-completeness, and undecidability.

Prerequisite(s): CS 583 and discrete mathematics.

CS 611 - Computational Methods for Genomics

Credits: 3 (NR)
This course covers fundamental principles and techniques for implementing computational algorithms to solve problems in biology arising from the need to process large volumes of genomic information. Topics include sequence analysis, alignments, sequence assembly, gene prediction, and protein structure prediction.
Prerequisite(s): CS 583; or permission of instructor.

CS 630 - Advanced Algorithms

Credits: 3 (NR)
Provides an overview of advanced algorithm design and analysis techniques. Topics include algorithms for hash tables, matrix operations, number theory, string matching, computational geometry, combinatorial optimization, and linear programming; also the areas of NP-completeness and approximation algorithms.

Prerequisite(s): CS 583

CS 631 - Object-Oriented Design Patterns

Credits: 3 (NR)
Principles of object-oriented design through design patterns. Studies selection of appropriate object-oriented structure after system requirements or requirements specification of software system have been developed. Design patterns created in logic view of software system. Studies generalized design solutions for generalized software design problems, and reuse of design patterns. Once developed, design patterns may be specified in any object-oriented language.

Equivalent to SWE 631

Prerequisite(s): SWE 619 or 620, or CS 540 or 571; or graduate course in object-oriented programming or equivalent.

CS 633 - Computational Geometry

Credits: 3 (NR)
Basic principles and methods for computing in field of geometric modeling. Emphasizes data structures used to represent geometric objects and algorithms for manipulating those data structures. Topics include range searching, polygon triangulation, convex hulls, motion-planning, visibility, and mesh generation.

Prerequisite(s): CS 583
CS 635 - Foundations of Parallel Computation

Credits: 3 (NR)  
Covers three major parallel computing paradigms: MIMD computation, SIMD computation, and data flow computation. Emphasizes interfaces between algorithm design and implementation, architecture, and software. Examines parallel algorithms and parallel programming languages relative to architecture of particular parallel computers.

Prerequisite(s): CS 583, and 540 or 571; or equivalent.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

CS 640 - Advanced Compilers

Credits: 3 (NR)  
Examines advanced compiler techniques such as code optimizations for sequential and parallel machines; compilers for logical, functional, or object-oriented languages; and other topics in current literature.

Prerequisite(s): CS 540 and 583, or equivalent

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

CS 650 - Advanced Database Management

Credits: 3 (NR)  
Data models for network, hierarchical, object-oriented, and relational management information systems. Covers development (including internal structures) of a database system.

Prerequisite(s): CS 550 or INFS 614.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

CS 658 - Networked Virtual Environments

Credits: 3 (NR)  
Topics covered in lecture are: networked virtual environment overview, networking technology, network multimedia concepts, virtual simulation concepts, efficiency/performance issues, and online conferencing/virtual classrooms. The project consists of four segments, each covering one aspect of networked virtual environments, plus a final session where one- or two-person teams create a minimally functional networked virtual environment over the Internet using overlay multicast software. The course consists of 31 50-minute sessions plus a major Java programming project which will be presented and discussed in class and two 90-minute examinations. Lectures are recorded in Network EducationWare (NEW) format and are available for playback on a flexible schedule, which is necessary since the course is shared among institutions having different academic calendars.
Prerequisite(s): CS 555

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 659 - Theory and Applications of Data Mining

Credits: 3 (NR)
Concepts and techniques in data mining and multidisciplinary applications. Topics include databases; data cleaning and transformation; concept description; association and correlation rules; data classification and predictive modeling; performance analysis and scalability; data mining in advanced database systems, including text, audio, and images; and emerging themes and future challenges.

Equivalent to CS 750 (2011-2012 Catalog)

Prerequisite(s): CS 580.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring

CS 662 - Computer Graphics Game Technologies

Credits: 3 (NR)
Addresses some graphics game techniques including collision detection, levels of detail, physics-based simulations, textures, maps, and shadows.

Prerequisite(s): CS 551.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 667 - Biometrics and Identity Management

Credits: 3 (NR)
Basic principles and methods for automatic authentication of individuals. Technologies include among others face, fingerprint, and iris recognition, and speaker verification. Additional topics cover multimodal biometrics, system design, performance evaluation, and privacy concerns. Term project required.

Equivalent to IT 667 (2009-2010 Catalog)

Prerequisite(s): CS 580 or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CS 671 - Advanced Operating Systems

Credits: 3 (NR)
Advanced topics in design and implementation of microkernel-based, object-oriented, and distributed operating systems. Specific topics include support for interprocess communication, interaction between computer architecture and operating systems, distributed file systems, transactions, and distributed shared memory.

Prerequisite(s): CS 571, MATH 351 or Permission of Instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 672 - Computer System Performance Evaluation

Credits: 3 (NR)
Theory and practice of analytical models of computer systems. Topics include queuing networks, single and multiple class mean-value analysis, models of centralized and client-server systems, software performance engineering, and web servers performance.

Equivalent to STAT 652

Prerequisite(s): CS 571 and MATH 351, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 673 - Multimedia Computing and Systems

Credits: 3 (NR)
Focuses on technological and development environments in developing multimedia applications. Projects involve experience with multimedia authoring tools and simulations to assess performance.

Prerequisite(s): CS 571.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 675 - Distributed Systems

Credits: 3 (NR)
Issues in design and implementation of distributed systems and applications. Topics include distributed communication paradigms, middleware, coordination and synchronization, distributed transactions, consistency and replication, fault-tolerance and reliability, and peer-to-peer systems.
Prerequisite(s): CS 571 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 680 - Natural Language Processing

Credits: 3 (NR)
Explores principles of designing computer programs that respond appropriately to questions, commands, and statements expressed in human language, particularly English. Role of knowledge representation and linguistic theory. Students become familiar with current literature to implement a limited natural language processor.

Prerequisite(s): CS 540 and 580.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 681 - Designing Expert Systems

Credits: 3 (NR)
Design, construction, and evaluation of software systems that solve problems generally deemed to require human expertise. Focuses on study and use of relevant languages, environments, mathematics, and logic. Case studies of successful systems. Programming projects include development of tools or small-scale systems.

Prerequisite(s): CS 580.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 682 - Computer Vision

Credits: 3 (NR)
Study of computational models of visual perception and their implementation in computer systems. Topics include early visual processing, edge detection, segmentation, intrinsic images, image modeling, representation of visual knowledge, and image understanding.

Prerequisite(s): CS 580 and 583.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 683 - Parallel Algorithms
Credits: 3 (NR)
Examines design and analysis of parallel algorithms. Material focuses on algorithms for both theoretical and practical models of parallel computation. Considers algorithm design and analysis for PRAM and existing SIMD and MIMD type architectures. Topics include sorting, graph algorithms, numerical algorithms, and computational complexity.

Prerequisite(s): CS 583; CS 635 recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 684 - Graph Algorithms

Credits: 3 (NR)
Data structures and analytical techniques to study graph algorithms. Data structures include disjoint sets, heaps, and dynamic trees. Algorithms include minimum spanning trees, shortest path, maximum flow, and graph planarity.

Prerequisite(s): CS 583.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 685 - Intelligent Systems for Robots

Credits: 3 (NR)
Reviews developments in intelligent autonomous systems. Studies applications of artificial intelligence, computer vision, and machine learning to robotics. Topics include analysis and design of algorithms and architectures for planning, navigation, sensory data understanding, sensor fusion, spatial reasoning, motion control, knowledge acquisition, learning concepts and procedures, self-organization, and adaptation to environment.

Prerequisite(s): One of CS 580, ECE 650, SYST 611 or 555, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 686 - Image Processing and Applications

Credits: 3 (NR)
Concepts and techniques in image processing. Discusses methods for image capture, transformation, enhancement, restoration, and encoding. Students complete projects involving naturally occurring images.

Prerequisite(s): CS 583 and either STAT 344 or MATH 351, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CS 687 - Advanced Artificial Intelligence

Credits: 3 (NR)
Explores foundational issues of artificial intelligence, such as roles of knowledge and search, formalization of knowledge and inference, and symbolic versus emergent approaches to intelligence. Studies advanced programming techniques for artificial intelligence, relationship to foundational issues, and important application areas for artificial intelligence.

Prerequisite(s): CS 580.

Notes: Major programming project required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 688 - Pattern Recognition

Credits: 3 (NR)
Explores statistical pattern recognition and neural networks. Pattern recognition topics include Bayesian classification and decision theory, density (parametric and nonparametric) estimation, linear and nonlinear discriminant analysis, dimensionality reduction, feature extraction and selection, mixture models and EM, and vector quantization and clustering. Neural networks topics include feed-forward networks and back-propagation, self-organization feature maps, and radial basis functions. Course emphasizes experimental design, applications, and performance evaluation.

Prerequisite(s): CS 580 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 689 - Planning Motions of Robots and Molecules

Credits: 3 (NR)
This course covers topics from artificial intelligence, algorithms and databases. It presents algorithms that model and simulate physical and biological systems. The course will focus on motion-planning algorithms for robotic systems in the presence of obstacles. Simple deterministic and sampling-based approaches to motion planning will be covered. Advanced planning methods including planning with kinematics and dynamic constraints will also be presented. Selected topics will include sensor-based motion planning, manipulation planning, assembly planning, planning under uncertainty and robotics-inspired methods to compute functionally-relevant motions of molecular chains.

Prerequisite(s): CS 583

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

CS 695 - Topics in Computer Science
Special topics in computer science not occurring in regular computer science sequence.

**Prerequisite(s):** Completion of two core courses, and permission of instructor.

**Notes:** May be repeated for credit when subject distinctly different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CS 697 - Independent Reading and Research**

Credits: 1-3 (NR)  
In areas of importance but insufficient demand to justify a regular course, students may undertake a course of study under supervision of consenting faculty member. Students usually submit written statement of course content and tentative reading list as part of request for approval. Literature review, project report, or other written product usually required.

**Prerequisite(s):** Graduate standing; completion of at least two of core courses CS 540, 571, 580, and 583; and permission of instructor.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

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**CS 700 - Quantitative Methods and Experimental Design in Computer Science**

Credits: 3 (NR)  
Integrated treatment to models and practices of experimental computer science. Topics include scientific methods applied to computing, workload characterization, forecasting of performance and quality metrics of systems, uses of analytic and simulation models, design of experiments, interpretation and presentation of experimental results, hypothesis testing, and statistical analyses of data. Involves one or more large-scale projects.

**Prerequisite(s):** STAT 344, at least two 600-level courses in computer science, and doctoral status.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CS 706 - Concurrent Software Systems**

Credits: 3 (NR)  
Topics include concurrent programming languages and constructs, and specification, design, verification, and validation of concurrent programs. Students required to solve concurrent programming problems and check solutions by using verification, testing, and debugging tools.

**Prerequisite(s):** CS 571 and SWE 621 or 631, or equivalent

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
CS 719 - Scaling Technologies for E-business

Credits: 3 (NR)
Discusses, from quantitative point of view, characteristics of most important technologies used to support implementation of e-business sites. Includes topics such as hardware and software architectures of e-business sites, authentication, payment services, understanding customer behavior, workload characterization, scalability analysis, and performance prediction.

Equivalent to IT 809

Prerequisite(s): At least one operating system and one networking course, and admission to VSITE doctoral program.

Notes: Term paper and project required.

CS 719 - Scaling Technologies for E-business

CS 735 - Concurrency

Credits: 3 (NR)
Studies techniques, tools for specifying and verifying concurrent and distributed programs. Topics may include model checking, temporal logic, process algebra, and test generation. Automated verification tools used to specify and verify concurrent programs.

Prerequisite(s): CS 635 or 706, or equivalent.

CS 752 - Interactive Graphics Software

Credits: 3 (NR)
Advanced graphics methods and tools. Topics include visualization, modeling, rendering, animation, simulation, virtual reality, graphics software tools, and current research topics.

Prerequisite(s): CS 551 and CS 583.

CS 753 - Parallel Computation

Credits: 3 (NR)
Covers topics illustrating contemporary thinking on architectures, application, development environments, algorithms, operating systems, language requirements, and performance.
Prerequisite(s): CS 635 or CSI 801.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CS 755 - Advanced Computer Networks**

Credits: 3 (NR)
Current and emerging issues in advanced computer networks and applications. Topics include software systems associated with packet and cell-switched networking architectures and protocols, high-performance LANs, scheduling and congestion control, mobile networking, multimedia applications, and next generation of Internet.

Prerequisite(s): CS 555.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CS 756 - Performance Analysis of Computer Networks**

Credits: 3 (NR)
Analytical and simulation techniques for modeling and analyzing computer networks. Examines elementary queuing analysis; networks of queues; routing and flow controls; and applications to local and wide area networks, Internet, and emerging networking technologies.

Prerequisite(s): CS 555.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CS 757 - Mining Massive Datasets**

Credits: 3 (NR)
Covers the techniques to mine large datasets, including Distributed File Systems and Map-Reduce, similarity search, and data stream processing. Covers classic problems in data mining, such as clustering, association rule mining, and others from the point of view of scalability. Includes a final project to exercise concepts covered in class.

Prerequisite(s): CS 659 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

When Offered: Fall

**CS 773 - Real-Time Systems Design and Development**
Real-time systems and principles supporting design and implementation. Emphasizes fundamental results from real-time scheduling theory and relevance to computer system design. Topics include system design issues for real-time applications involving communication networks, operating systems, databases, and multimedia.

Prerequisite(s): CS 555 or CS 671 or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 774 - Computational Vision

Credits: 3 (NR)
Studies recent advances in development of machine vision algorithms and knowledge-based vision systems. Topics include scalespace; Gabor and wavelet processing; distributed and hierarchical processing using neural networks; motion analysis; active, functional, and selective perception; object and target recognition; expert systems; data fusion; and machine learning. Emphasizes system integration in terms of perception, control, action, and adaptation. Presents applications to robotics, intelligent highways, inspection, forensic, and data compression.

Prerequisite(s): CS 682 and 686 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 775 - Advanced Pattern Recognition

Credits: 3 (NR)
Covers statistical pattern recognition, neural network, and statistical learning theory approaches. Topics include decision theory and Bayes' theorem, density (parametric and nonparametric) estimation, linear and nonlinear discriminant analysis, SVM and kernel methods, SRM and model selection, performance evaluation, mixture of experts (AdaBoost), dimensionality reduction, feature selection and extraction, and clustering. Emphasizes experimental design, applications, and performance evaluation.

Prerequisite(s): CS 688 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 776 - Graphical Real-Time Simulation

Credits: 3 (NR)
Current research in advanced computer graphics, and applications in realistic real-time simulations. Topics include physically based modeling, real-time simulation, distributed interactive simulation (DIS), network virtual environments (NVE), and virtual reality (VR).

Prerequisite(s): CS 551.
CS 777 - Human-Computer Intelligent Interaction

Credits: 3 (NR)
Current and emerging issues in human-computer intelligent interaction, and human-centered systems and their applications. Topics include video processing, visualization, virtual environments, adaptation and tutoring, image and scene modeling, analysis and synthesis, face and gesture recognition, and speech and natural language processing.

Prerequisite(s): CS 580, and 551 or 682; or permission of instructor.

Notes: Term project and topical review required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 779 - Topics in Resilient and Secure Computer Systems

Credits: 3 (NR)
Course covers study of alternate computer security. It will explore how these can be combined in a layered defense and factors that affect the selection of the architectures. The course will review recent papers and reports.

Prerequisite(s): CS 571 and ISA 562 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

CS 780 - Data Mining on Multimedia Data

Credits: 3 (NR)
This course covers advanced techniques for managing, searching, and mining of various types of data such as text, web links, images, time series, video, and audio. Issues related to handling such data will be discussed, including feature selection, high dimensional indexing, interactive search and information retrieval, pattern discovery, and scalability.

Equivalent to INFS 780

Prerequisite(s): CS 659 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 782 - Machine Learning
Surveys machine learning concerning development of intelligent adaptive systems that are able to improve through learning from input data or from their own problem-solving experience. Topics provide broad coverage of developments in machine learning, including basic learning strategies and multistrategy learning.

**Prerequisite(s):** CS 681, 687, or 688; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CS 785 - Knowledge Acquisition and Problem Solving**

Credits: 3 (NR)  
Principles and major methods of basic stages of knowledge acquisition such as systematic elicitation of expert knowledge, knowledge base refinement, and knowledge base optimization in the context of general problem-solving methods. Includes case studies of successful knowledge acquisition and problem-solving systems, and projects involving development or application of knowledge acquisition tools for knowledge-based systems.

**Prerequisite(s):** CS 680, 681, or 687; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CS 787 - Decision Guidance Systems**

Credits: 3 (NR)  
Decision-guidance systems support an iterative process of giving actionable recommendations to and extracting feedbacks from human decision-makers, with the goal of arriving at the best possible course of action. This course focuses on models, languages, algorithms and applications of Decision-Guidance Management Systems, used for fast development of decision-guidance applications.

**Prerequisite(s):** INFS 614 or CS 650 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**CS 795 - Advanced Topics in CS**

Credits: 3 (RT)  
Advanced topics not occurring in regular sequence.

**Prerequisite(s):** Admission into computer science PhD program.

**Notes:** May be repeated for credit when subject differs. Satisfies MS breadth requirement only if explicitly stated in syllabus in given section. Only one such course should be used for breadth requirements.
CS 798 - Project Seminar

Credits: 3 (NR)
Master's degree candidates undertake a project using knowledge gained in MS program.

Prerequisite(s): 18 credits applicable toward MS in computer science.

Notes: Topics chosen in consultation with advisor. Meets project or thesis requirement for MS in computer science.

CS 799 - Thesis

Credits: 1-6 (RD)
Original or expository work evaluated by committee of three faculty members.

Prerequisite(s): 18 credits applicable toward MS in computer science.

CS 800 - Computer Science Colloquium

Credits: 0 (RD)
Students are required to attend colloquia including talks by distinguished speakers, faculty candidates, and Mason faculty.

Prerequisite(s): Admission to CS PhD program.

Notes: This course introduces PhD students to research topics in computer science. This course can be taken twice for credit.

CS 811 - Research Topics in Machine Learning and Inference

Credits: 3 (NR)
 Presents unifying principles that underlie diverse methods, paradigms, and approaches to machine learning and inference.
Reviews most known learning and inference systems, discusses strengths and limitations, and suggests most appropriate areas of application. Hands-on experience by experimenting with state-of-the-art learning and inference systems, and working on projects tailored to research interests.

Prerequisite(s): CS 680 or 681, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 818 - Topics in Computer Systems

Credits: 3 (NR)
Discussion of current research topics in computer systems. Topics vary according to faculty interest. Possible topics include peer-to-peer computing, high-performance distributed computing, sensor and ad hoc networks, autonomic computing, virtualization, and web services and middleware.

Equivalent to IT 818

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 880 - Research Topics in Artificial Intelligence

Credits: 3 (RD)
Special topics in artificial intelligence not occurring in regular computer science sequence.

Equivalent to IT 910

Notes: Requires substantial student participation. Subject matter may include continuation of existing 600- or 700-level courses in artificial intelligence or other topics. May be repeated for credit when subject matter differs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CS 884 - Advanced Topics in Computer Vision and Robotics

Credits: 3 (RD)
Covers recent developments. Topics motivated by applications to autonomous robotic systems, mobile robot navigation, multirobot systems, human-computer-environment interaction, image/video search and analysis, content discovery, and visual surveillance. Topics include 3D structure and motion recovery, motion understanding, map building and localization, object detection and recognition, and target tracking. Projects and experimental evaluation emphasized.

Prerequisite(s): CS 682 or 685, or permission of instructor depending on topics offered.

Notes: Course may be repeated with change of topic.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 895 - Research Topics in CS

Credits: 3 (RT)
Advanced topics not occurring in regular sequence.

Prerequisite(s): Intended for doctoral students. Permission of instructor.

Notes: May be repeated for credit when subject differs. Only one such course should be used for breadth requirements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CS 896 - Directed Reading and Research

Credits: 1-6 (RD)
Reading and research on a specific topic under the direction of a faculty member.

Prerequisite(s): Permission of Instructor.

Notes: May be repeated up to a total of 9 credits. Students can sign up for this class only after passing the CS PhD qualifying exams.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

CS 990 - Dissertation Topic Presentation

Credits: 0 (NR)
Students put together a professional presentation of a research proposal and present it for critique to fellow students and interested faculty.

Equivalent to IT 990, STAT 990.

Prerequisite(s): Completion of all course requirements for PhD, or permission of instructor.

Notes: May be repeated with change of research topic, but credit toward doctoral degree is given once.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12

CS 998 - Doctoral Dissertation Proposal
Work on research proposal that forms basis for doctoral dissertation.

Prerequisite(s): Admission to candidacy.

Notes: May be repeated as needed. No more than 24 credits of CS 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

CS 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Formal record of commitment to doctoral dissertation research under direction of faculty member in computer science.

Prerequisite(s): Admission to candidacy.

Notes: May be repeated as needed. No more than 24 credits of CS 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

Conflict Analysis and Resolution (CONF)

Offered by the School of Conflict Analysis and Resolution

CONF 101 - Conflict and Our World

Credits: 3 (NR)
Brief history of field, survey of key conflict resolution themes and theories, and intervention methods. Overview includes general factors of conflict and its resolution; and nature of conflict in interpersonal, group, organizational, and international situations.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

CONF 190 - Advising Seminar for Conflict Majors

Credits: 1 (NR)
This course examines issues and opportunities relevant to CONF majors to enhance their overall success in the program. Topics may include academic planning, field experience processes, critical thinking in coursework, career exploration and readiness, and
CONF 210 - Theories of Conflict Analysis and Resolution

Credits: 3 (NR)
Through this course students will utilize critical thinking and analytical skills to begin an in-depth examination of the major theories of conflict analysis and resolution. Theories and case studies will include root causes and dynamics of conflict, and methods of conflict analysis and resolution.

Prerequisite(s): CONF 101.

Notes: Required course for all CONF majors (BA and BS) beginning Fall 2011.

CONF 300 - Conflict Resolution Techniques and Practice

Credits: 3 (NR)
Advanced consideration of CONF 101 topics, introduction of core notion of reflective practice, conflict resolution techniques, practice, third party roles, and ethics.

Corequisite(s): CONF 101 or permission of instructor.

CONF 301 - Research and Inquiry in Conflict Resolution

Credits: 3 (NR)
Introduces social science research methods at undergraduate level. Covers basic epistemology of social research, including quantitative and qualitative methods, emphasizing participatory action research, and evaluation and assessment work.

Prerequisite(s): CONF 101 and 210 and 45 credits, or permission of instructor.
CONF 302 - Culture, Identity, and Conflict

Credits: 3 (NR)
Covers deeply rooted, intractable, or protracted social conflicts around core issues of identity, including race, ethnicity, religion, and nationalism. Explores cultural, symbolic, and discursive approaches to identity conflict.

Fulfills writing intensive requirement in the major.

Prerequisite(s): CONF 101.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

CONF 315 - Discovering Organizations and Actors in the Conflict Field

Credits: 3 (NR)
Designed to give students the opportunity to discover the range of actors and organizations in the field of conflict resolution and to reflect on the possibilities and constraints that shape professional engagement in real world conflicts. In this seminar based course, students will also be encouraged to think about themselves as actors and build upon their knowledge, skills, and abilities.

Prerequisite(s): CONF 101.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

CONF 320 - Interpersonal Conflict Analysis and Resolution

Credits: 3 (NR)
Covers conflict at micro level, introducing theories drawn from various disciplines including psychology, anthropology, and conflict resolution. Uses readings, case studies, and role plays to develop ability to analyze and intervene in interpersonal conflicts. Also prepares for further course work for interpersonal conflict concentration.

Prerequisite(s): CONF 101 and 210 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 325 - Dialogue and Difference

Credits: 3 (NR)
Covers challenges of communicating across differences of age, gender, language, culture, political orientation, and contextual situations. Students will engage in preparing and analyzing communication strategies in conflict situations and over the term will participate in a dialogue that explores the meaning and experience of difference on the Mason campus.
CONF 330 - Community, Group, and Organizational Conflict Analysis and Resolution

Credits: 3 (NR)
Covers conflict at mezzo level, introducing theories of social harmony and conflict, drawing on sociology, social psychology, community psychology, organizational psychology, administration of justice, philosophy, and conflict resolution. Uses case studies, class presentations, and group projects to develop ability to analyze conflict and make recommendations for change. Also prepares for further course work for community and organizational conflict concentration.

Prerequisite(s): CONF 101 and 210 or permission of instructor.

CONF 331 - Simulation in Community and Organizational Conflict Resolution

Credits: 1 (NR)
Building on the theories and concepts presented in CONF 330, this laboratory/simulation class focuses on the practice of group and community conflict. Through intensive simulations using conflict cases, students will have the opportunity to practice conflict resolution skills such as dialogue, problem solving, mediation and negotiation and gain a practical understanding of third party roles and intervention strategies in community, group and organizational settings.

CONF 340 - Global Conflict Analysis and Resolution

Credits: 3 (NR)
Covers conflict at macro level, introducing theories of international and global violence and conflict, drawing from disciplines of international relations, political science, intercultural communication, and conflict resolution. Covers impact of globalization and structural causes of conflict. Uses class discussions, case studies, and final paper to develop analytical skills to help in analysis of conflict. Prepares for further course work for international conflict concentration.

Prerequisite(s): CONF 101.

CONF 341 - Global Conflict Resolution Practice
Credits: 1 (NR)
Focuses primarily on global conflict resolution practice. Using the methodologies of dialogue, problem-solving, and intensive simulation, students will increase their theoretical and practical understanding of peace making, peace building, and transformation processes within a specific international case.

Corequisite(s): CONF 340 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 345 - Social Dynamics of Terrorism, Security, and Justice

Credits: 3 (NR)
Course presents students with analytical frameworks to account for terrorist acts and organizations, and explore social dynamics underlying the development of, and response to, terrorism. Topics may include recruitment into violent groups, counterterrorism and human rights concerns, role of religious and political ideologies in terrorism and counterterrorism, media coverage of terrorism, and effects of terrorism on social structures and processes.

Equivalent to CONF 240 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CONF 370 - Internship Field Experience

Credits: 1-9 (RD)
Internships will provide an opportunity for students to gain practical experience, reflect on those experiences, and apply academic theories outside of the normal classroom environment. Students will apply academic theories learned in the classroom to situations that arise in the work environment. Students must obtain approval and complete an internship proposal application in order to be registered for the course.

Prerequisite(s): CONF 101, CONF 300. Permission of instructor.

Notes: Course does not have a regular meeting time; students submit work via blog and e-mail; some meetings with instructor.

Hours of Lecture or Seminar per week: 1-9
Hours of Lab or Studio per week: 1-12
When Offered: Fall, Spring, Summer

CONF 375 - Special Programs Field Experience

Credits: 1-6 (RD)
Learning experience in the application of conflict analysis and resolution (CAR) skills in special program settings. Provides supervised practice in CAR techniques, leadership, program implementation, and strategies to facilitate conflict resolution in educational institutions or community settings.
Prerequisite(s): Permission of instructor and director, controlled enrollment form required.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

CONF 385 - International Field Experience

Credits: 3 (RD)
Investigates conflict theory through international field experience including participation in formally organized course offered by Center for Global Education or another form of international field experience approved by program director.

Prerequisite(s): CONF 101 and permission of advisor.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 393 - Philosophy, Conflict Theory, and Violence

Credits: 3 (NR)
Examines causes, sources, and origins of group violence with particular attention to group violence of ethnicity conflict. Explores alternative proposals that explain why violence becomes primary, or at least viable, form of revolving conflict in some societies.

Prerequisite(s): CONF 101 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 394 - Human Rights and Inequality

Credits: 3 (NR)
This course examines inequality, social justice, and human rights in an age of globalization. Topics may include international law and order, welfare-and social policy, regionalism and multilateralism, environmental protection, gender equality, terrorist and transnational criminal networks, human trafficking, modern slavery, world poverty, corporate military firms, governance of global financial institutions, security, and transnational social movements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CONF 399 - Special Topics in Conflict Analysis and Resolution
Credits: 3 (RT)
Examines selected topics relating to analysis or resolution of conflict. Topics vary but may include historical examination of conflict, social issues stemming from conflict, ethical issues in intervention, globalization, human rights, sources of conflict, or relationship of particular identity domains to conflict.

Notes: May be repeated for up to 9 credits if topics vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 490 - Integration

Credits: 3 (NR)
Capstone course in which students reflect on what they have learned, integrating knowledge from course work and synthesizing it to cogent body of knowledge. Includes class discussion and final project that demonstrates understanding of conflict theory and reflective practice.

Fulfills general education requirement in synthesis.

Prerequisite(s): 300-level CONF course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 499 - Independent Research in Conflict Analysis and Resolution

Credits: 1-6 (RD)
Readings and research conducted on individual basis in consultation with instructor.

Prerequisite(s): CONF 101, CONF 300, CONF 301, and permission of program director.

Notes: Student may not present more than 3 credits for graduation credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

CONF 501 - Introduction to Conflict Analysis and Resolution

Credits: 3 (NR)
Prerequisite or corequisite for all MS CONF majors. Introduces field of conflict analysis and resolution. Examines definitions of conflict and diverse views of its "resolution." Explores thinking about human behavior, and social systems as they relate to origins of conflict and role of conflict in violent and peaceful social change. Considers appropriate responses to conflict at interpersonal, intergroup, industrial, communal, and international levels.

Prerequisite(s): CONF 501

Notes: Permission of instructor not required for this course.
CONF 502 - Intensive Introduction to Conflict Analysis and Resolution

Credits: 3 (NR)
Introduces field of conflict analysis and resolution. Examines the origins of social conflict, the practices and strategies for responding to conflict, and frameworks for constructive intervention. Considers interpersonal, community, and large-scale intergroup conflict.

CONF 595 - Selected Topics

Credits: 1-3 (RT)
Topics vary each semester and are announced each academic year.

Prerequisite(s): CONF 501.

CONF 601 - Theories of Conflict and Conflict Resolution

Credits: 3 (NR)
Examines major theories of conflict causation and motivation. Emphasizes need for theories to inform processes of conflict resolution. Weaves together ideas from conventional disciplines with new approaches, especially with regard to causes and methods of resolving deep-rooted conflict.

Prerequisite(s): CONF 501 or 801

CONF 610 - Philosophy and Methods of Conflict Research

Credits: 3 (NR)
Introduces students to the philosophies behind social science research and the methods for conducting research in the field of conflict resolution. Focuses on the identification of research problems associated with particular conflict situations, selection of appropriate research methods, and the design of effective research projects.

Prerequisite(s): CONF 501 or 801
CONF 611 - MS Research II

Credits: 3 (NR)
Guides students through design, execution, interpretation, analysis, presentation, and evaluation of field research in conflict and resolution.

Prerequisite(s): CONF 501 and 610

Notes: Builds on CONF 610.

CONF 620 - Reflective Practice in Interpersonal-Multiparty Conflicts

Credits: 3 (NR)
Introductory skill-building course integrating conflict theory and practice using reflective practitioner model. Students learn necessary skills for third-party facilitation and mediation, including active listening, empathy, paraphrasing, reframing, and negotiation, in addition to analytical skills of problem solving and creation of transformational processes. Cases for practice focus on interpersonal and intergroup conflict.

Equivalent to CONF 713 (2011-2012 Catalog)

Corequisite(s): CONF 501.

CONF 621 - Reflective Practice in Organizational or Community Conflict

Credits: 3 (NR)
Moves from conflicts that are simply described to those with multilevel components, such as community and organizational conflicts. Expands skills acquired in CONF 620 by adding recording chronology, identifying roles played by various participants, observing turning points in process, and precisely stating agreed-on solution.

Corequisite(s): CONF 501 and CONF 620.
CONF 622 - Reflective Practice in International Conflict and Civil Strife

Credits: 3 (NR)
Continues study of resolution processes as applied to highly complex systems, especially where one party denies legitimacy of existing political authority. Considers third-party options for intervention in revolutionary and international conflicts, building communication and trust among parties, and implementing agreements.

Corequisite(s): CONF 501 and CONF 620.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

CONF 642 - Integration of Theory and Practice

Credits: 3 (NR)
Taken in last semester of master's student course work. Assists in developing students' own theories of conflict and conflict resolution by reviewing and integrating prior course work. Students expected to demonstrate holistic comprehension by writing major essay of publishable quality.

Prerequisite(s): CONF 501, 601, 610, 713

Corequisite(s): CONF 501, 601, 610, 713

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 643 - Pract: Conf Anly/Resolut

Credits: 3 (NR)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

CONF 650 - Conflict Analysis and Resolution Advanced Skills

Credits: 3 (NR)
Introduces innovative practices and provides structure to reflect on and improve ability to work within conflict settings. Considers the intersection of theory and practice, with special attention to the challenges of translation, adaptation, and transfer of skills and models.

Prerequisite(s): CONF 501 or 502

Corequisite(s): CONF 501 or 502
CONF 651 - Conflict Analysis and Resolution for Collaborative Leadership in Community Planning

Credits: 3 (NR)
Covers designing collaborative processes to work with diverse stakeholders to build meaningful and lasting shared agreements. Considers applications in land use, development, or other community planning contexts.

Prerequisite(s): CONF 501 or 502
Corequisite(s): CONF 501 or 502

CONF 652 - Conflict Analysis and Resolution for Prevention, Reconstruction, and Stabilization Contexts

Credits: 3 (NR)
Considers conflict analysis and resolution approaches to designing, implementing, and evaluating holistic cross-sectoral, conflict-sensitive initiatives in areas of potential violence and postconflict reconstruction and stabilization contexts.

Prerequisite(s): CONF 501 or 502
Corequisite(s): CONF 501 or 502

CONF 653 - World Religions, Diplomacy, and Conflict Resolution

Credits: 3 (NR)
Analyzes ways world religions play role in conflicts, war, diplomacy, peace making, and conflict resolution.

Prerequisite(s): CONF 501 or 502
Corequisite(s): CONF 501 or 502

CONF 656 - Integrating Complementary Approaches in Conflict Analysis and Resolution
Credits: 3 (NR)
Considers designs and methods for conflict analysis and resolution that integrate multiple approaches, stakeholders, and methods. Applies to social conflicts in local and international contexts.

Prerequisite(s): CONF 501 or 502
Corequisite(s): CONF 501 or 502

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 657 - Facilitation Skills

Credits: 3 (NR)
Covers range of skills in group facilitation processes, with emphasis on conflict analysis and resolution approaches to improve group communication. Includes skill-building exercises.

Prerequisite(s): CONF 501 or 502
Corequisite(s): CONF 501 or 502

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 658 - Diversity and Difference in Conflict Analysis and Resolution

Credits: 3 (NR)
Covers elements of cultural diversity, understanding, and awareness, as well as creative ways of approaching issues of diversity, identity, worldviews, and territory. Considers individuals, organizations, communities and nations.

Prerequisite(s): CONF 501 or 502
Corequisite(s): CONF 501 or 502

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 659 - Leadership in Conflict Analysis and Resolution

Credits: 3 (NR)
Covers roles and styles of leadership in interpersonal, organizational, community, group, and international conflicts. Considers cultural roles of leaders as insider-partial, negotiators, facilitators, and mediators.

Prerequisite(s): CONF 501 or 502
Corequisite(s): CONF 501 or 502
CONF 660 - Conflict Assessment and Program Evaluation

Credits: 3 (NR)
Covers assessment methods appropriate to conflict contexts, and related evaluation approaches and techniques for use in areas of peace building, community processes, or interpersonal conflict.

Prerequisite(s): CONF 501 or 502

Corequisite(s): CONF 501 or 502

CONF 665 - Special Topics in Conflict Analysis and Resolution

Credits: 3 (RD)
In-depth study of contemporary areas of conflict resolution practice.

Prerequisite(s): CONF 502 or permission of the instructor

Notes: Fulfills elective requirement for certificate program. Topics vary.

CONF 668 - Applied Integration for Graduate Certificates

Credits: 3 (NR)
Capstone course facilitating integration of learning in the graduate certificate programs, and appropriate mentored application and experiential learning.

Prerequisite(s): CONF 501 or 502; CONF 660; and CONF 650,651,652 or 653

CONF 682 - Principles of Environmental Conflict Resolution

Credits: 3 (NR)
Explores the nature and characteristics of environmental conflict and efforts to manage, resolve or transform it. Students will develop a capacity to assess the strengths and weaknesses of environmental conflict resolution processes while learning about
best practices for preventing, preparing for, and addressing environmental conflict.

Equivalent to EVPP 682

**Prerequisite(s):** CONF 501, 502, EVPP 607 or permission of instructor

**Hours of Lecture or Seminar per week:** 3

**Hours of Lab or Studio per week:** 0

**CONF 683 - Environmental Conflict Resolution and Collaboration: Situation Assessment, Process Design and Best Practices**

Credits: 3 (NR)
Explores best practices for managing, resolving, and transforming environmental conflict using environmental conflict resolution (ECR) processes. Nature and dynamics of environmental disputes, methods for assessing conflict situations, and methods for conducting various forms of ECR processes will be covered in the context of selected case studies with emphasis on student involvement.

Equivalent to EVPP 683

**Prerequisite(s):** CONF 682/EVPP 682 or permission of instructor

**Hours of Lecture or Seminar per week:** 3

**Hours of Lab or Studio per week:** 0

**CONF 684 - Environmental Conflict Resolution and Collaboration: Leadership Practicum/Capstone**

Credits: 3 (NR)
Capstone course for the Graduate Certificate in Environmental Conflict Resolution and Collaboration. Under supervision of the instructor, students will undertake an assessment of an active environmental conflict and recommend a range of processes that promote identified goals for preferred conflict outcomes.

Equivalent to EVPP 684

**Prerequisite(s):** CONF 682/EVPP 682, CONF 683/EVPP 683

**Hours of Lecture or Seminar per week:** 3

**Hours of Lab or Studio per week:** 0

**CONF 690 - Practicum in Conflict Analysis and Resolution**

Credits: 3 (RD)
In-depth field study of ongoing conflict situations, and design and delivery of intervention processes to manage or resolve conflicts.
Prerequisite(s): CONF 501 or 801, and 713

Notes: Two semesters, 3 credits per semester.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 5
Grading: Graduate Special

CONF 694 - Internship

Credits: 1-6 (RT)
Students are expected to mesh theory and practice through observation and experience. Includes comprehensive report analyzing experiences. For 3 credits of internship students must complete 160 hours of work on site. Students must receive permission of the Internship Coordinator prior to registering.

Prerequisite(s): 21 credits, including CONF 620.

Notes: Under direction of internship coordinator, students spend at least 160 hours on project involving study, resolution of conflict for each 3-credit internship.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-6
Grading: Graduate Special

CONF 695 - Selected Topics

Credits: 3 (RT)
Topics vary; they are announced each academic year.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 697 - Directed Reading

Credits: 1-3 (RT)
Independent reading at master's level on specific topic related to conflict analysis and resolution, as agreed to by student and faculty member.

Notes: May be repeated up to 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-3

CONF 701 - Theories of Social Harmony
Credits: 3 (NR)
Explores theories that define and explain social harmony and cooperation. Examines social institutions that manage and mediate conflict at all levels. Draws from major social science theorists from a variety of disciplines.

**Prerequisite(s):** CONF 501 or 801; CONF 601 recommended but not required

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

CONF 702 - Peace Studies

Credits: 3 (NR)

Examines diverse meanings of peace, conflict, and violence, and then reviews different issues relevant to understanding peace and conflict, including the sources of war, poverty and economic disparities, and ecological degradation. Other topics to be covered are peace keeping, peace building, sustainable development, ecological preservation, nonviolence, and peace movements.

Designated a Green Leaf Course.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

CONF 703 - Conceptions of Practice

Credits: 3 (NR)

Provides framework for integrating theory and practice in conflict resolution. Reviews types of practice and theories of intervention and change, discusses analytic process of assessment and diagnosis before intervention. Considers how research can be incorporated into practice and how thoughtful practice generates research questions. Includes methods of program evaluation and action research. Students encouraged to identify, develop their own theories.

**Prerequisite(s):** CONF 501, 601, 713.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

CONF 708 - Identity and Conflict

Credits: 1-3 (NR)

Explores complex interrelations of social identity and postmodern conflicts in society. Emphasizes the role of identity in processes of conflict resolution and transformation. Critical rethinking of ethnic, national, and religious identities as both generators and outcomes of conflict are an important part of the course. Extends knowledge on structure and dynamics of identity-based conflicts and develops a framework for their resolution. Course includes lectures, simulations, and case studies.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
CONF 709 - War, Violence, and Conflict Resolution

Credits: 3 (NR)
Considers various theories, causes, and conditions of violence, and applies them to variety of cases: family abuse, religious and ethnic violence, terrorism, revolution, and warfare. Applies insights from study of initiation, escalation, management, resolution, and prevention of violence to theories about resolving deep rooted conflicts.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 711 - The Conventions of Statistical Methodology

Credits: 3 (NR)
Introduces students to study design, data collection, and measurement. Teaches students how to identify research problems, and formulate research questions and hypotheses. Exposes students to various design strategies and provides a working knowledge of indicator construction, validity threats, and sampling techniques. Reviews a variety of approaches as exemplified by such topics as the experimental method, survey methodology, longitudinal/panel data/pooled data studies, and game theoretical approaches. Emphasis is placed on recognizing the relationship between theoretical and substantive questions; the methodology employed and the analytical strategies that are utilized. Focuses on developing the conceptual tools necessary to design and assess empirical research studies, and the technical and basic computer skills necessary to conduct statistical research.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 720 - Ethnic and Cultural Factors in Conflict Resolution

Credits: 1-3 (NR)
Examines the role culture plays in genesis, structuring, and resolution of processes of conflict within and between groups. Special attention to ethnicity and other subcultural markers of identity in complex social systems as generators and outcomes of conflict. Explores relevance of variables to success or failure of conflict resolution.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 721 - Conflict and Race

Credits: 3 (NR)
Addresses historic analyses of racial and ethnic identity conflicts and their resolution.

Equivalent to SOCI 523
CONF 722 - Conflict and Religion

Credits: 3 (NR)
Explores role of religious ideas, practices, and organizations in conflict, war, peace making, and conflict resolution.

Prerequisite(s): CONF 501 or 801

CONF 723 - Conflict and Gender

Credits: 3 (NR)
Examines constructs of gender and conflict as they relate to critical analysis of theory and practice. Reviews feminist theories for contributions to social and conflict theories. Uses narratives to explore how gender, power dynamics interact in conflict.

Prerequisite(s): CONF 501 or 801

CONF 724 - Conflict and 'Isms'

Credits: 3 (NR)
Prerequisite(s): CONF 501 or 801; 720 recommended.

CONF 725 - Conflict and Spirituality

Credits: 3 (NR)
Prerequisite(s): CONF 501 or 801.
CONF 726 - Moral and Philosophical Foundations of Conflict

Credits: 3 (NR)
Explores major historical and contemporary positions on the intellectual, moral, and religious foundations for analyzing and resolving conflict. Enhances critical abilities in metacritique, dialectics, and intellectual self-appropriation.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 728 - Human Rights Theory and Practice in Comparative Perspective

Credits: 3 (NR)
Introduces major controversies and debates surrounding use of human rights theory and practice cross-culturally. After basic study of human rights philosophy, uses case studies from around the world to examine problems and potential of human rights in today's globalized world.

Prerequisite(s): CONF 501 or 801, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 729 - Approaches to Violence

Credits: 3 (NR)
Explores violence from variety of intellectual and political perspectives. Readings are wide-ranging and interdisciplinary, addressing levels of analysis from biological to nation-state and transnational processes.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 730 - Structural Sources of Conflict

Credits: 3 (NR)
Examines how structures and institutions affect behavior and give rise to conflictual relationships at all social levels, from interpersonal to the international. Explores role of conflict resolution as political process providing opportunities for nonviolent system change.

Prerequisite(s): CONF 501 or 801, and 601 for MS; or 803 for PhD

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CONF 731 - Conflict in Organizations

Credits: 3 (NR)
Explores intersection and dynamics of organizational behavior and dimensions of conflict. Involves theoretical perspectives and cases examining conflict analysis and resolution. Practices strategies for prevention and intervention. Field research in greater metropolitan area integrates course content.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 732 - Conflict in Development

Credits: 3 (NR)
Examines the relationship between processes of political and economic change and conflict; the relationship between democratization and conflict; the relationship between structural adjustment policies and conflict; and the challenges of postconflict reconstruction.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 733 - Law and Justice from a Conflict Perspective

Credits: 1-3 (NR)
Contrasts legal processes and institutions with alternative approaches to dispute resolution. Defines and distinguishes among law, "alternative dispute resolution," and problem-solving analysis as methods for resolving rather than controlling conflict. Examines to what extent legal procedures are truly applicable to resolving deep-rooted conflict.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 734 - Conflict and Crime

Credits: 3 (NR)
Prerequisite(s): CONF 501 or 801 or Permission of Instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CONF 735 - Global Context of Conflict

Credits: 3 (NR)
Advances skills and knowledge base in critical analysis and creative problem-solving. Examines root causes of conflict in global context in terms of gender inequality, cultural differences, unequal North and South relations, militarism, economic oppression, genocide, maldevelopment, religious and ethnic struggles, and environmental scarcity. Students develop their own conceptual tool boxes to analyze conflicts in different parts of the world.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 736 - Globalization and International Conflict

Credits: 3 (NR)
Explores economic, political, social, and cultural meanings of globalization; how they affect conflict processes at international level; and when and under what conditions globalization promotes cooperation or conflict.

Prerequisite(s): CONF 501 or 801.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 737 - Societies/Globalizatn/Conflict

Credits: 3 (NR)
Prerequisite(s): CONF 501 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 739 - Collective Action, Social Movements, and Globalization

Credits: 3 (NR)
Explores how people translate underlying grievances into collective action. Examines how groups organize, frame, and develop strategies and tactics to pursue agendas, and how processes of globalization have influenced social movement dynamics.

Prerequisite(s): CONF 501 or 801.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 740 - Conflict Roles, Resources, and Ethics
Conf 741 - Negotiations

Credits: 3 (NR)
Analyzes and critiques nature and roles in conflicts. Uses theoretical perspectives, case histories to understand how settings affect roles. Includes ethical assessment of interventions in variety of conflict settings.

Prerequisite(s): CONF 501 or 801, 713

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Conf 742 - Environment and Policy

Credits: 3 (NR)
Uses negotiating experiences to construct framework for thinking about and analyzing negotiation processes. Framework then used to organize review of research literature on rhythms and patterns of negotiation, and to analyze actual cases. Interweaves exercises, class projects with state-of-the-art concepts and findings.

Prerequisite(s): CONF 501 or 801 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Conf 743 - Dynamics of Conflict Termination

Credits: 3 (NR)
Investigates a number of themes relating to war termination with an emphasis on contemporary civil wars. Considers the nature of civil war, focuses attention on a number of contemporary cases, raises questions relating to settlement and series of themes relating to peace implementation and peace building.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Conf 744 - Peace Keeping
CONF 745 - Leadership Roles in Conflict and Conflict Resolution

Credits: 3 (NR)
Leadership responses to conflict are affected by several variables, including race, ethnicity, and gender. Explores roles of leadership decision-making styles as agents of conflict across range of conflict scenarios at interpersonal, community, organizational, and international levels.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 746 - Peace Building

Credits: 3 (NR)
Building on initiatives of United Nations and other multilateral organizations, explores dynamics of post-conflict peace building. Prepares students of conflict resolution to play innovative roles in reconstruction of civil societies.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 747 - Reconciliation

Credits: 3 (NR)
Explores processes of acknowledgment, reconciliation, forgiveness, and restitution. Reviews literature, case studies, and other research to assess applicability and impact of these efforts.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 748 - Comparative Peace Processes

Credits: 3 (NR)
Compares case studies drawn from actual peace processes, both successful and unsuccessful, to illuminate principles and
complexities.

Prerequisite(s): CONF 501 or 801, and 601 or 803.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 749 - World Religions, Violence, and Conflict Resolution

Credits: 1-3 (NR)
Examines how world religions play a role in conflict and conflict resolution. Investigates how values, world view, and hermeneutics influence strategies for successful conflict interventions.

Prerequisite(s): CONF 501 or 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 750 - Evaluation of Conflict Resolution Initiatives

Credits: 3 (NR)
Examination of models and methodologies for evaluation of conflict resolution initiatives. Evaluation approaches taught will include action evaluation, program evaluation, formative evaluation, and summative evaluation. Students will be expected to complete an evaluation design for an actual conflict resolution-related initiative as the major course requirement and participate in the class evaluation project.

Prerequisite(s): CONF 501 or 801.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 795 - Professional Development Seminars

Credits: 1-2 (RT)
These 1- and 2-credit courses are scheduled non-conventionally using weekends, concentrated presentations, and intersession periods to develop advanced professional skills. Possible topics include marketing conflict resolution services, academic course design, training design, mediation, facilitation, family practice, fundraising, writing for publication, advanced field research techniques, and grassroots applications of conflict resolution.

Prerequisite(s): CONF 501 or 801, or permission of instructor.

Notes: May be repeated.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
CONF 797 - Proposal Development

Credits: 1 (NR)
Covers development of research proposal for master’s thesis, including framing a question, literature review, and designing appropriate methodology. Students form master’s thesis committee and review Human Subjects Review Board’s guidelines and procedures.

Corequisite(s): CONF 501 and 610

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit only
When Offered: Fall, Spring

CONF 799 - Master's Thesis

Credits: 1-6 (RT)
Two semesters, usually taken as 3 credits per semester. Original research or analysis under direction of thesis committee.

Prerequisite(s): CONF 501, 713, 610.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-6
Grading: Satisfactory/No Credit

CONF 801 - Introduction to Conflict Analysis and Resolution

Credits: 3 (NR)
Introduces field of conflict analysis and resolution for doctoral students. Examines definitions of conflict and diverse views of resolution. Explores thinking about human behavior and social systems as they relate to origins and role of conflict in violent and peaceful social change. Considers appropriate responses to conflict at interpersonal, intergroup, industrial, communal, and international levels.

Notes: Prerequisite or corequisite for all PhD CONF students

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 802 - Theories of the Person

Credits: 3 (NR)
Understanding human conflict requires knowledge of human behavior, motivation, and perception. Reviews and critically analyzes several psychological theories for application to conflict analysis and resolution theory and practice.

Prerequisite(s): CONF 801
CONF 803 - Structural Theories

Credits: 3 (NR)
Understanding social conflict and potential for conflict resolution requires that both conflict and cooperation be perceived in relation to patterns of social change. Course reviews and critiques significant theories of social change to establish a basis for creative conflict analysis and resolution.

Prerequisite(s): CONF 801.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 804 - Alternate Theoretical Foundations

Credits: 3 (NR)
Familiarizes students with the ideas generated by the Frankfurt School of social theorists and others who have extended or altered these ideas. Students will use these insights to deepen an understanding of serious social conflicts and to explore the implications of critical theories for conflict resolution processes.

Prerequisite(s): CONF 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 811 - Quantitative Foundations

Credits: 3 (NR)
Building on logic of inquiry, introduces steps in research process to prepare dissertation and implement published research. Covers wide array of quantitative research approaches in social sciences, with emphasis on conflict analysis.

Prerequisite(s): CONF 801.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 812 - Qualitative Foundations: Social Sciences
Continuation of steps in research process to prepare dissertation and implement published research. Builds on CONF 811 by examining qualitative research approaches used in social sciences, with emphasis on conflict analysis.

**Prerequisite(s):** CONF 801.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CONF 813 - Qualitative Foundations: Humanities**

Credits: 3 (NR)  
Explores qualitative research design as it pertains to the humanities, including the methods and epistemology behind the various issues likely to emerge in the process of conducting research. In addition to material on research design and methodology, reading assignments include several monographs that employ different qualitative methodologies.

**Prerequisite(s):** CONF 801

**Corequisite(s):** CONF 801

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CONF 820 - Reflective Practice in Interpersonal-Multiparty Conflicts**

Credits: 3 (NR)  
Introductory skill-building course integrating conflict theory and practice using reflective practitioner model. Students learn necessary skills for third-party facilitation and mediation, including active listening, empathy, paraphrasing, reframing, and negotiation, in addition to analytical skills of problem solving and creation of transformational processes. Cases for practice focus on interpersonal and intergroup conflict.

Equivalent to CONF 713 (2011-2012 Catalog)

**Corequisite(s):** CONF 801.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 3  
**When Offered:** Fall, Spring

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**CONF 821 - Reflective Practice in Organizational or Community Conflict**

Credits: 3 (NR)  
Moves from conflicts that are simply described to those with multilevel components, such as community and organizational conflicts. Expands skills acquired in CONF 820 by adding recording chronology, identifying roles played by various participants, observing turning points in process, and precisely stating agreed-on solution.

**Corequisite(s):** CONF 801 and CONF 820.
CONF 822 - Reflective Practice in International Conflict and Civil Strife

Credits: 3 (NR)
Continues study of resolution processes as applied to highly complex systems, especially where one party denies legitimacy of existing political authority. Considers third-party options for intervention in revolutionary and international conflicts, building communication and trust among parties, and implementing agreements.

Corequisite(s): CONF 801 and CONF 820.

CONF 890 - Practicum in Conflict Analysis and Resolution

Credits: 3 (RD)
In-depth field study of ongoing conflict situations. Design and delivery of intervention processes to manage or resolve conflicts.

Prerequisite(s): CONF 801 and 713.

CONF 897 - Directed Reading

Credits: 1-3 (RD)
Independent reading at doctoral level on a specific topic related to conflict and conflict resolution as agreed to by student and faculty member.

CONF 900 - Integrating Theory, Practice, and Method in Conflict Analysis

Credits: 3 (NR)
Analyzes theoretical basis undergirding methods of research in conflict resolution. Explores how theory is built through reciprocal influence of research and practice. Assists students to fill in gaps in their knowledge and prepare for comprehensive examinations. Prepares students to write integrated research proposals.
Prerequisite(s): CONF 801 and 802, and at least 9 additional credits of required doctoral courses

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 901 - Theory Development

Credits: 3 (NR)
Prerequisite(s): CONF 801, 802, or Permission of Instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONF 998 - Doctoral Dissertation Proposal

Credits: 1-6 (RD)
Work on research proposal that forms basis for doctoral dissertation.

Prerequisite(s): Successful completion of all course work and doctoral qualifying exams

Notes: May be repeated.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

CONF 999 - Doctoral Dissertation Research

Credits: 1-12 (RD)
Research on approved dissertation topic under direction of committee. Student's dissertation proposal must be approved before registering for 999.

Notes: At least 12 credits of 998 and 999 must be accumulated toward degree.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
Grading: Satisfactory/No Credit

Conservation Studies (CONS)

Offered by the University
CONS 320 - Conservation in Practice

Credits: 3 (NR)
Work with a conservation mentor in a practicum experience. Create a portfolio documenting professional development.

Prerequisite(s): 60 credits and college level coursework in the biological or environmental sciences.

Notes: Must be taken concurrently with CONS 401, CONS 402, CONS 410, and CONS 490 or CONS 403, CONS 404, CONS 411, and CONS 491. Only offered through the Smithsonian-Mason Semester.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONS 401 - Conservation Theory

Credits: 3 (NR)
Introduces the field of conservation biology and science-based management of threatened wildlife, habitats, and human landscapes. Provides theoretical background for understanding the importance of biodiversity conservation and sustainability.

Prerequisite(s): 60 credits and college level coursework in the biological or environmental sciences.

Notes: Must be taken concurrently with CONS 320, CONS 402, CONS 410, and CONS 490. Only offered through the Smithsonian-Mason Semester. Students cannot get credit for this course and Biology 318 or NCLC 401.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

CONS 402 - Applied Conservation

Credits: 4 (NR)
A practical scientific approach to the nature of biodiversity and species loss. Students participate in field conservation exercises in a variety of settings, as well as endocrine and reproductive technology labs. Students apply field and laboratory experiences to understanding science's connection to management decision-making for conservation.

Prerequisite(s): 60 credits and college level coursework in the biological or environmental sciences.

Notes: Must be taken concurrently with CONS 320, CONS 401, CONS 410, and CONS 490. Only offered through the Smithsonian-Mason Semester.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

CONS 403 - Ecology and Conservation Theory

Credits: 3 (NR)
Students learn ecological theories that underlie successful conservation practice. Course content includes an in-depth examination
of factors that influence the distribution and abundance of organisms within landscapes across temporal and spatial scales. In individual and group activities, students review conservation case studies, interpret scientific data, and apply their analysis to conservation scenarios at many scales.

**Prerequisite(s):** Admission into the Smithsonian-Mason Monitoring Semester.

**Corequisite(s):** Enrollment in the Smithsonian-Mason Monitoring Semester.

**Hours of Lecture or Seminar per week:** 0-3  
**Hours of Lab or Studio per week:** 0-3

**CONS 404 - Monitoring and Assessment of Biodiversity**

Credits: 4 (NR)  
In lab and field experiences, students learn practical techniques for the assessment, monitoring and conservation of species and habitats. Students practice sampling species and learn to evaluate the effectiveness of those techniques. Through individual and group projects, students collect, analyze data across a variety of temporal and spatial scales.

**Prerequisite(s):** Admission into the Smithsonian-Mason Monitoring Semester.

**Corequisite(s):** Enrollment in the Smithsonian-Mason Monitoring Semester.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

**CONS 410 - Human Dimensions in Conservation**

Credits: 3 (NR)  
Provides sociological, local and global perspectives on conservation issues including adaptive management, conflict resolution, environmental economics, sustainability, public policy, environmental values and public opinion, and conservation ethics. Designated a Green Leaf Course.

Fulfills general education requirement in social and behavioral science.

**Prerequisite(s):** 60 credits and college level coursework in the biological or environmental sciences.

**Notes:** Must be taken concurrently with CONS 320, CONS 401, CONS 402, and CONS 490. Only offered through the Smithsonian-Mason Semester.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**CONS 411 - Science Communication for Conservation**
Credits: 3 (NR)
Addresses the need for clear, direct and proactive communication of scientific processes. Students design communication strategies for diverse audiences and learn skills to engage stakeholders in dialogue related to specific conservation issues. Through individual and group activities that emphasize written, visual and oral communications techniques, students learn how the messages can affect people.

Prerequisite(s): Admission into the Smithsonian-Mason Monitoring Semester.

Corequisite(s): Enrollment in the Smithsonian-Mason Monitoring Semester.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONS 420 - Human-Wildlife Conflict

Credits: 3 (NR)
Covers the impact of human-wildlife conflict on conservation efforts and human health and well being.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONS 490 - Integrated Conservation Strategies

Credits: 3 (NR)
Integrates the course work of the Smithsonian-Mason Semester through study of current conservation issues. Students incorporate interdisciplinary aspects of conservation into a summative group case study on a chosen conservation issue and present formally before a faculty panel.

Fulfills general education requirement in synthesis.

Prerequisite(s): Junior standing and a college level biological or environmental science course

Notes: Must be taken concurrently with CONS 320, CONS 401, CONS 402, and CONS 410. Only offered through the Smithsonian-Mason Semester.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONS 491 - Comprehensive Conservation Planning

Credits: 3 (NR)
Students construct a synthesis project integrating the conservation theory, application, and communications techniques presented throughout the semester. With a mentor, students develop a monitoring and assessment plan for a species or habitat of conservation concern, working individually and in teams. This plan includes background, measurable objectives, sampling strategies, proposed data analysis and a communications and media plan.

Prerequisite(s): Admission into the Smithsonian-Mason Monitoring Semester.
Corequisite(s): Enrollment in the Smithsonian-Mason Monitoring Semester.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CONS 497 - Special Topics in Conservation**

Credits: 1-3 (RD)
Topics of current relevance to the field of conservation.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

**CONS 498 - Internship**

Credits: 1-3 (RD)
Directed readings and final reflective paper or project in conjunction with an internship subject to instructor approval. Permission to enroll must be obtained from the Mason Center for Conservation Studies at least two weeks prior to the start of the semester.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-6

**CONS 499 - Independent Study/Research**

Credits: 1-3 (RD)
An independent project or directed exploration into an area of conservation not covered by other courses.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-12

**CONS 620 - Spatial Ecology, Geospatial Analysis & Remote Sensing for Conservation**

Credits: 3 (NR)
Teaches students to use spatial ecology, geospatial analysis, and remote sensing tools to assess and model species distribution and habitat use in dynamic landscapes. Includes computer and field labs with examples using data from Smithsonian research.
Notes: Offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian Conservation Biology Institute on site in Front Royal, VA. This course is not available to students pursuing a degree at George Mason without prior written approval of the graduate director of the student’s program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CONS 625 - Statistics for Ecology and Conservation Biology**

Credits: 3 (NR)
Provides an overview of experimental design and analysis techniques used in cutting-edge ecological research and conservation. Focuses on increasing knowledge of statistical tests, interpretation of results, and ability to disseminate and clearly explain these results. Students gain an overview of applied monitoring and analysis techniques such as distance sampling, genetic analysis, niche and species distribution modeling, and spatial analysis.

Prerequisite(s): Basic statistics course

Notes: Offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian Conservation Biology Institute on site in Front Royal, VA. This course is not available to students pursuing a degree at George Mason without prior written approval of the graduate director of the student’s program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CONS 630 - Species Monitoring & Conservation**

Credits: 3 (RD)
Explores monitoring and conservation research methods and approaches for specific taxa through lectures, case studies, lab exercises, and field work. Focuses on conservation science and conservation outreach techniques.

Prerequisite(s): A general biology (or relevant species-related) course and a statistics course, or permission of instructor. Prior coursework in environmental science, zoology, and ecology recommended.

Notes: May be repeated for credit with approval of the Mason Center for Conservation Studies. A maximum of 6 credits may be applied to the Applied Conservation Science Certificate.

Offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian Conservation Biology Institute on site in Front Royal, VA. This course is not available to students pursuing a degree at George Mason without prior written approval of the graduate director of the student’s program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CONS 635 - Non-Invasive Genetic Techniques in Wildlife Conservation**
Credits: 2 (NR)
Introduces the benefits, drawbacks and applications of non-invasive genetic techniques to wildlife conservation; focuses on answering questions in animal behavior, population biology, and population management, particularly for vertebrate populations; provides hands-on experience relating to all stages of a research project utilizing modern noninvasive methods from sample collection to data analysis and interpretation.

Prerequisite(s): College-level Genetics Course AND College-level Ecology/Evolution Course.

Notes: This course is taught as an intensive, mixed-format (lectures, discussions, lab and computer exercises) offering, in a residential, full-day, 1-week session held at the Smithsonian Conservation Biology Institute in Front Royal, VA. Students also complete pre-course reading assignments, and prepare and submit final projects after the intensive onsite session has concluded.

Hours of Lecture or Seminar per week: 0-2
Hours of Lab or Studio per week: 0-2

CONS 640 - Adaptive Management for Conservation Success

Credits: 3 (NR)
Sound training in adaptive management is essential for conservationists dealing with the challenges of a changing planet. In groups, students develop a management plan for a real-world conservation project using the adaptive management framework of the Open Standards for the Practice of Conservation. Students can extend the techniques to their own work after the course.

Notes: This Smithsonian-Mason Conservation Studies Program course is an intensive 2-week fulltime residential session, incorporating lectures, discussions, and student exercises on group projects. This course will be held at the Smithsonian Conservation Biology Institute’s 3,200 acre facility in Front Royal, VA, USA

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONS 660 - Effective Conservation Leadership

Credits: 3 (NR)
Teaches effective leadership and management through individual assignments and group exercises. Explores international environmental and conservation case studies, offers hands-on experience to help students develop their own leadership styles.

Prerequisite(s): None; students should have a basic background in conservation, ecology, environmental sciences, or similar field.

Notes: Offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian Conservation Biology Institute on site in Front Royal, VA. This course is not available to students pursuing a degree at George Mason without prior written approval of the graduate director of the student’s program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONS 665 - Conservation Conflict Resolution
Focuses on approaches to cultivating sustainable conservation solutions, including determining root causes of complex conflict dynamics, designing decision-making processes to address conflict, and building mutual respect and trust among stakeholders. Employing principles and strategies developed by the Human-Wildlife Conflict Collaboration (HWCC), students learn how to resolve current conservation conflicts, anticipate arising ones, and reconcile old conflicts that impede new progress. Designated a Green Leaf Course.

Notes: Offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian Conservation Biology Institute on site in Front Royal, VA. This course is not available to students pursuing a degree at George Mason without prior written approval of the graduate director of the student’s program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CONS 697 - Special Topics in Conservation

Credits: 1-3 (RD)
Topics of current relevance to the field of conservation.

Prerequisite(s): Vary with topic.

Notes: May be repeated for credit with approval of the Mason Center for Conservation Studies. A maximum of 6 credits may be applied to the Applied Conservation Science Certificate.

Offered through the Mason Center for Conservation Studies in cooperation with the Smithsonian Conservation Biology Institute on site in Front Royal, VA. This course is not available to students pursuing a degree at George Mason without prior written approval of the graduate director of the student’s program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

Counseling and Development (EDCD)

Offered by the College of Education and Human Development

EDCD 500 - In-Service Educational Development

Credits: 1-6 (NR)
Offered at request of school division or other educational agency.

Notes: Content varies; may be repeated for credit.
EDCD 525 - Advanced Human Growth and Development

Credits: 3 (NR)
Covers human development throughout the life span, including emotional, physical, and cognitive development; and emphasizes personal adjustment and achievement.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCD 597 - Special Topics in Education

Credits: 1-6 (RD)
Provides advanced study on selected topic or emerging issue in American or international education.

Notes: May be repeated for credit with GSE permission.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDCD 598 - Directed Reading, Research, and Individual Projects

Credits: 1-6 (RT)
Presents various subjects and projects, principally by directed study, discussion, research, and participation under supervision of graduate faculty member.

Prerequisite(s): Admission to degree program and permission of dean.

Notes: May be repeated for up to 12 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCD 599 - Thesis

Credits: 6 (NR)
Study of problem of significant interest to student using accepted research methods and under supervision of graduate faculty member.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0
Grading: Graduate Special
**EDCD 600 - Workshop in Education**

Credits: 1-6 (NR)
Offers full-time workshops and weekend seminars on selected topics in education and education tour seminars.

**Notes:** May be repeated for credit.

- **Hours of Lecture or Seminar per week:** 1-6
- **Hours of Lab or Studio per week:** 0

**EDCD 601 - Introduction to Research in Counseling**

Credits: 3 (NR)
Enhances knowledge of and involvement in counseling research by introducing techniques and principles to design, implement, and evaluate research projects and program development in community and school settings.

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0

**EDCD 602 - Foundations in Counseling**

Credits: 3 (NR)
Emphasizes history of counseling; multifaceted role of counselors, professional organizations, and memberships; and APA style. Provides a thorough understanding of the CNDV Mission Statement, Mason's Honor Code and Professional Dispositions. Basic skills are briefly introduced and an orientation to multiculturalism and social justice is provided.

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0

**EDCD 603 - Counseling Theories and Practice**

Credits: 3 (NR)
Covers major theoretical approaches to counseling from a multicultural perspective and provides supervised introduction to basic skills.

**Prerequisite(s):** Admission to CNDV program; EDCD 602 (course may be taken concurrently).

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0

**EDCD 604 - Assessment and Appraisal in Counseling**

Credits: 3 (NR)
Prepares students to become informed about psychological and educational tests and assessment procedures that are used and
applied in a counseling context.

Prerequisite(s): Admission to CNDV program, EDCD 525, and EDCD 601.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCD 606 - Counseling Children and Adolescents

Credits: 4 (NR)
Presents theories, techniques, and counseling issues relevant to children and adolescents. Counseling lab provides practice with an emphasis on process and culturally competent counseling strategies.

Prerequisite(s): Admission to CNDV program, EDCD 525 and EDCD 603

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

EDCD 608 - Group Processes and Analyses

Credits: 4 (NR)
Presents theories appropriate to various types of groups and descriptions of group practices, methods, dynamics, and facilitative skills. Focuses on applying theory to practice. Includes lab.

Prerequisite(s): Admission to CNDV program, EDCD 603; and EDCD 606 or EDCD 609

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

EDCD 609 - Advanced Counseling Skills and Strategies

Credits: 4 (NR)
Covers counseling skills and process, counselor self-awareness, and strategies associated with major counseling theories. A counseling lab provides skills practice with an emphasis on process and culturally competent counseling strategies.

Prerequisite(s): Admission to CNDV program, EDCD 525 and EDCD 603

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

EDCD 610 - Career and Educational Counseling

Credits: 3 (NR)
Presents theories and counseling issues relevant to career counseling in schools and community agencies.
Prerequisite(s): Admission to CNDV program; EDCD 603, 606 or 609.

Corequisite(s): EDCD 604.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCD 611 - Introduction to Ethical and Legal Issues in School Counseling

Credits: 2 (NR)
Introduces principles, practices, and application of ethical and legal issues in school counseling.

Prerequisite(s): Admission to counseling and development program and EDCD 626

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EDCD 618 - Principles and Practices of Counseling in International Schools

Credits: 3 (NR)
Discusses philosophy, principles, and practices for effective international school counseling programs including leadership, advocacy, and program evaluation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCD 620 - Counseling Children and Adolescents in International Schools

Credits: 3 (NR)
Discusses counseling international school students K-12 from developmental and multicultural perspectives.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCD 626 - Principles and Practices of School Counseling

Credits: 3 (NR)
Introduces school counseling program development at K-12 levels. Presents philosophy, principles, and practices of effective school counseling.

Prerequisite(s): Admission to CNDV program, EDCD 602 (course may be taken concurrently).
EDCD 628 - Counseling and Social Justice

Credits: 3 (NR)
Studies relationship between counseling and social justice, and theories, models, and strategies of social justice, social change, leadership, and advocacy in community and school settings. Emphasizes application of theories and models.

Prerequisite(s): Admission to CNDV program, EDCD 603, and 626 or 654.

Corequisite(s): EDCD 660.

EDCD 652 - Introduction to Substance Abuse Counseling

Credits: 3 (NR)
Introduces substance abuse counseling. Covers addiction issues, diagnosis and treatment planning, and individual and group counseling strategies with diverse populations.

Prerequisite(s): Admission to the Counseling and Development program and EDCD 603 or concurrent.

Corequisite(s): EDCD 603

EDCD 654 - Counseling, Ethics, and Consultation in Community Agencies

Credits: 3 (NR)
Emphasizes types of services and facilities provided, needs and problems of client population served, role and function of counselor in agency setting, and personnel needs of the individual agency.

Prerequisite(s): Admission to counseling and development program and EDCD 603

Corequisite(s): EDCD 603

EDCD 656 - Diagnosis and Treatment Planning for Mental Health Professionals
Reviews diagnostic criteria associated with mental illness, emphasizes the cultural component of mental illness, and helps students develop written plans and simulate implementation for overall diagnosis and treatment of clients and their families.

**Prerequisite(s):** Admission to CNDV program, EDCD 603 (course may be taken concurrently).

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDCD 658 - Couples and Family Counseling

Credits: 3 (NR)  
Introduces major approaches to counseling couples and families. Uses case studies and simulations to facilitate transition from theory to practice.

**Prerequisite(s):** Admission to CNDV program; EDCD 609 (may be taken concurrently).

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDCD 660 - Multicultural Counseling

Credits: 3 (NR)  
Covers counseling from a multicultural perspective. Explores counseling issues for diverse populations with a focus on ethnicity and race.

**Prerequisite(s):** Admission to CNDV program, EDCD 608.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDCD 754 - Practicum in Counseling and Development

Credits: 3-6 (NR)  
Provides supervised practice in counseling setting similar to setting in which student may work. Weekly graduate class emphasizes site processing.

**Prerequisite(s):** Completion of CNDV program except for practicum and internship; permission of advisor; overall GPA of 3.00; no grade of C in skills courses EDCD 605, 607, 608, and 610; and no more than two grades of C in any other graduate course work required by counseling and development program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

### EDCD 755 - Practicum in Counseling
EDCD 790 - Internship in Counseling and Development

Credits: 3-6 (NR)
Provides supervised practice in counseling setting similar to setting in which student may work. Skills and practice build on previous practicum experiences. Weekly graduate class emphasizes site processing.

Prerequisite(s): Completion of CNDV program except for CNDV 610 or 611 or electives (total credits cannot exceed 3 credits); permission of advisor; overall GPA of 3.00; no grade lower than B in skills courses EDCD 603, 606, 608, and 609; no more than two grades of C in any other graduate course work required by CNDV program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
Grading: Satisfactory/No Credit

EDCD 791 - Internship in Counseling

Credits: 3 (NR)
Provides supervised practice for minimum of 200 hours (for school counseling students) and 300 hours (for community agency students) in counseling setting similar to setting in which student may work. Skills and practice build on previous practicum experiences. Weekly graduate class emphasizes site processing.

Prerequisite(s): Completion of CNDV program course work except for EDCD 610 or 611 or electives (total credits cannot exceed 3 credits); permission of advisor; overall GPA of 3.00; no grade lower than B in skills courses EDCD 603, 606, 608, and 609; no more than two grades of C in any other graduate course work required by CNDV program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
Grading: Satisfactory/No Credit

EDCD 797 - Advanced Topics in Education

Credits: 1-6 (RT)
See EDUC 797.
Prerequisite(s): Admission to CNDV program, EDCD 603.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDCD 895 - Emerging Issues in Counseling and Development

Credits: 3 (NR)
Examines issues in counseling profession, including counseling theory and methodology, development of client groups, new roles and settings for counselors, emerging assessment procedures, new understanding of diagnosis; and impact of societal changes on counseling profession.

Prerequisite(s): Admission to PhD program, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCD 896 - Advanced Multicultural Counseling

Credits: 3 (NR)
Focuses on advanced issues in multicultural counseling, including multicultural counseling theories, skills, assessment, supervision, research, and ethics.

Prerequisite(s): Master's degree in counseling or related counseling field from accredited institution of higher education, EDCD 660 or equivalent, EDCD 895, and admission to counseling and development PhD specialization; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCD 897 - Advanced Group Counseling

Credits: 3 (NR)
For doctoral students who have had experience and training in group work. Provides greater understanding and advanced skill application in group dynamics, group process, and group leadership.

Prerequisite(s): Master's degree in counseling or related counseling field from accredited institution of higher education, EDCD 608 or equivalent, EDCD 895, and admission to counseling and development PhD specialization; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCD 898 - Grant Writing and Publishing
Credits: 3 (NR)
Focuses on grant writing and publishing in counseling and psychology.

**Prerequisite(s):** Master's degree in counseling or related counseling field from accredited institution of higher education, EDCD 895, and admission to counseling and development PhD specialization; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCD 990 - Advanced Internship in Counseling Leadership**

Credits: 3 (NR)  
Provides supervised practice in counseling leadership setting or position. Emphasizes counseling leadership in practice.

**Prerequisite(s):** Admission to the Ph.D. in Education program, Counseling and Development specialization; EDCD 628 or equivalent; EDCD 895.

**Notes:** Biweekly class emphasizes site processing, leadership skills, and topical seminars.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCD 991 - Advanced Internship in Multicultural Counseling**

Credits: 3 (NR)  
Provides supervised practice in multicultural training setting. Emphasizes intensive use of multicultural competencies in practice, supervision, and program development and evaluation in school and community agency settings. Biweekly class emphasizes site processing, leadership skills, and topical seminars.

**Prerequisite(s):** Admission to counseling and development PhD specialization; and EDCD 895, 896, and 628 or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCD 992 - Advanced Internship in Social Justice**

Credits: 3 (NR)  
Provides opportunities to implement programs and strategies to affect social justice for clients in school or community settings.

**Prerequisite(s):** Admission to counseling and development PhD specialization, EDCD 628 or equivalent, and EDCD 895.

**Notes:** Biweekly class emphasizes topical seminars and supervision.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special
Criminology (CRIM)

Offered by the College of Humanities and Social Sciences

CRIM 100 - Introduction to Criminal Justice

Credits: 3 (NR)
Overview of the American system of criminal justice, covering theories of justice, criminal law, policing, courts and associated pre and post-trial legal processes, punishment and corrections, and juvenile justice. Required for all criminology majors and minors.

Fulfills general education requirement in social and behavioral science.

Equivalent to ADJ 100 (2009-2010 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 210 - Introduction to Criminology

Credits: 3 (NR)
Explores and evaluates how crime is defined and measured, and examines crime patterns and trends. Provides an overview and critical assessment of the major theories of crime causation.

Prerequisite(s): CRIM 100.

Notes: CRIM majors who are concentrating in criminal justice are strongly encouraged to take this course before or during the first semester of taking upper-level courses in the concentration.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 220 - Introduction to Law and Society

Credits: 3 (NR)
Introduces the relationship between law and society. Discusses theoretical perspectives from a number of social science disciplines. Promotes a foundational understanding of the concept of law and the origins, development, and role of law in society, particularly outside of formal legal institutions. Topics covered may include legal mobilization, law and social change, social movements, law and inequality, and law's relationship to social control.

Prerequisite(s): CRIM 100.

Notes: CRIM majors who are concentrating in Law and Society are strongly encouraged to take this course before or during the first semester of taking upper-level courses in the concentration.
CRIM 230 - Introduction to Homeland Security

Credits: 3 (NR)
Introduces fundamental concepts of homeland security. Examines governmental actions designed to prevent, prepare for, respond to, and recover from man-made and natural disasters. Focuses on efforts to align preparedness, incident management, and emergency response plans from various agencies (federal, state, local, tribal, private sector, and non-governmental).

Equivalent to CRIM 461 (2010-2011 Catalog); ADJ 461 (2009-2010 Catalog).

Prerequisite(s): CRIM 100

Notes: CRIM majors who are concentrating in homeland security and justice are strongly encouraged to take this course before or during the first semester of taking upper-level courses in the concentration.

CRIM 301 - Public Law and the Judicial Process

Credits: 3 (NR)
Covers American judicial organization and operation, role of the Supreme Court in policy formation, and selected constitutional principles.

Equivalent to ADJ 301 (2009-2010 Catalog) and GOVT 301

Prerequisite(s): CRIM 100

CRIM 302 - Delinquency

Credits: 3 (NR)
Presents theories of juvenile delinquency and societal reactions to it, gender differences in rates and types, historical overview, development of juvenile justice system, and critical assessment of juvenile justice and its alternative.

Equivalent to ADJ 302 (2009-2010 Catalog)

Prerequisite(s): CRIM 100
CRIM 304 - Computer Crime, Forensics, and Auditing

Credits: 3 (NR)
Covers computer crime, relevant laws, agencies, standards, auditing, logging, forensics, and related software. Explores legal principles such as chain of evidence, electronic document discovery, eavesdropping, and entrapment. Hands-on experience with forensics tools.

Equivalent to IT 357; ADJ 304 (2009-2010 Catalog)

Prerequisite(s): IT 103 and 223.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 305 - Crime and Crime Policy

Credits: 3 (NR)
Examines the development of crime policy, including the influence of crime trends, politics, public opinion, media, criminological theory, and empirical research. Considers the effectiveness of crime policy.

Equivalent to ADJ 305 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 306 - Criminal Justice Ethics

Credits: 3 (NR)
Analyzes ethical principles relevant for those working in criminal justice. Required for all criminology majors.

Equivalent to ADJ 306 (2009-2010 Catalog)

Prerequisite(s): CRIM 100.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 307 - Social Inequality, Crime, and Justice

Credits: 3 (NR)
Explores the significance of social inequality (especially race and gender inequality) for several crime and criminal justice issues. Examines the effect of gender and race on rates of criminal offending and victimization and explanations for the variation in offending and victimization.
Equivalent to ADJ 307 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CRIM 308 - Human Rights and Justice**

Credits: 3 (NR)
Studies the norms, laws, and systems for the promotion and protection of human rights. Provides a foundation for understanding historical, legal, political, economic, and ethical aspects of human rights. Examines ideological and cultural perspectives, sources of violations, the United Nations, regional and national mechanisms, special issues (e.g., women, torture, children, minorities), and the role of nongovernmental organizations.

Equivalent to ADJ 308 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CRIM 310 - Introduction to Intelligence Analysis**

Credits: 3 (NR)
Introduces students to the structure, function, and process of the intelligence community including the basic skills in writing, research, and presentation used in intelligence analysis. Required for all intelligence analysis minors.

Prerequisite(s): CRIM 100.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**CRIM 315 - Research Methods and Analysis in Criminology**

Credits: 3 (NR)
Provides an introduction to research design, methods, and analysis in the field of criminology. Students learn to understand, interpret, and critique quantitative and qualitative research approaches, and become intelligent consumers of research.

Equivalent to CRIM 300 (2011-2012 Catalog); ADJ 300 (2009-2010 Catalog)

Prerequisite(s): CRIM 100.

Notes: This course does not meet the College's IT requirements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CRIM 400 - Applied Criminal Psychology

Credits: 3 (NR)
Uses overview of psychological and criminological theories to apply behavioral science theory to practical application in forensic settings. Focuses on analysis of various crime scenes and characteristics of offenders.

Equivalent to ADJ 400 (2009-2010 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 401 - Policing in America

Credits: 3 (NR)
Fundamental issues relevant to contemporary public policing in America: role and history of police; impact on crime, disorder, and other social problems; discretion and its control; moral hazards; police legitimacy and public support; police culture and the police organization; and community policing.

Equivalent to ADJ 401 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 402 - Punishment and Corrections

Credits: 3 (NR)
Covers theories on forms of punishment systems; punishment and corrections as a product of historical, cultural, and political changes; differences by race and gender in punishment and corrections; problems of social control and violence in prisons; alternative rehabilitation; and community prevention strategies.

Equivalent to ADJ 402 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 403 - Community Corrections

Credits: 3 (NR)
Studies the purposes and goals of community-based corrections and its various components, including pretrial diversion, probation, parole, and emerging alternatives to traditional incarceration. Addresses issues related to offenders returning to the
community and critical issues facing jails, community corrections, and the management of offenders in community settings. Examines the role of community corrections within the broader correctional system.

Equivalent to ADJ 403 (2009-2010 Catalog)

**Prerequisite(s):** CRIM 100

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CRIM 404 - Crime Victims and Victimization**

Credits: 3 (NR)  
Explores experiences of crime victims, distribution of the risks of victimization, and causes and consequences of victimization. Also considers nature and influence of victim’s rights advocates.

Equivalent to ADJ 404 (2009-2010 Catalog)

**Prerequisite(s):** CRIM 100

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CRIM 405 - Law and Justice around the World**

Credits: 3 (NR)  
Comparative inquiry into the models of legal and justice systems around the world. Considers how social and legal norms are created, and how different societies exercise powers of social control. Evaluates justice models in action, including law and courts, policing, corrections, and juvenile justice.

Fulfills general education requirement in global understanding.

Equivalent to ADJ 405 (2009-2010 Catalog)

**Prerequisite(s):** CRIM 100

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**CRIM 406 - Family Law and the Justice System**

Credits: 3 (NR)  
Introduction to the elements of family law, and exploration of its influence on American social life and contemporary notions of justice. Topics include marriage and parenting, divorce, custody and support, nontraditional families, and domestic violence.

Equivalent to ADJ 406 (2009-2010 Catalog)
Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 407 - Advanced Topics in Law and Society

Credits: 3 (NR)
Provides an in-depth examination of the law's role in social life to deepen students' appreciation of the law in action. Focuses on scholarly research that describes and explains how legal actors, processes, and institutions operate in the world. Topics include: theories of legal change, law's relationship to class, gender, and race, and law, culture, and identity. Equivalent to ADJ 407 (2009-2010 Catalog)

Prerequisite(s): CRIM 100 or GOVT 301

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 408 - Criminal Courts

Credits: 3 (NR)
Studies the workings, advantages, and frailties of criminal courts, and explores whether the system works effectively and efficiently. Equivalent to ADJ 408 (2009-2010 Catalog)

Prerequisite(s): CRIM 100 or GOVT 301

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 409 - Community Policing

Credits: 3 (NR)
Study of community policing, particularly in the United States. Covers history and development of community policing, community relations, problem solving, and issues of organizational change. Equivalent to ADJ 409 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
CRIM 422 - Controversial Legal Issues

Credits: 3 (NR)
Focuses on the study of law as an institution that continuously interacts with other social institutions at the individual, community, state, and federal levels. Examines how constitutional and statutory laws are interpreted by the courts to determine and define the law through contemporary, controversial, legal issues. Explores how the courts, using the law, resolve today's most controversial issues.

Equivalent to ADJ 422 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 423 - Constitutional Law: Civil Rights and Liberties

Credits: 3 (NR)
Studies First Amendment freedoms of speech, press, assembly, association, and religion; the right to privacy; and Fourteenth Amendment right to equal protection.

Equivalent to ADJ 423 (2009-2010 Catalog) and GOVT 423

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 424 - Constitutional Law: Criminal Process and Right

Credits: 3 (NR)
Studies constitutional law pertaining to the rights of the criminally accused from investigation and evidence through attorney, trial, and punishment stages at federal and state levels. Required for all criminology majors.

Equivalent to ADJ 424 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 425 - Criminal Justice Management

Credits: 3 (NR)
Explains the management function for current and future criminal justice managers. Emphasizes communication, leadership skills, and organizational development.
CRIM 460 - Surveillance and Privacy in Contemporary Society

Credits: 3 (NR)
Philosophical perspectives, historical context, technological developments, and institutional changes that surround controversies about privacy and surveillance in contemporary society. Explores public and private institutions conducting surveillance, how they calculate and manage risk, and legal constraints on surveillance activities.

CRIM 462 - Law Enforcement and Homeland Security

Credits: 3 (NR)
Examines the effect of 9/11 on law enforcement organizations in the United States and explores the evolving relationship between the military, federal, state, and local law enforcement agencies in the post-9/11 era. Emphasis on understanding the entire framework of homeland security in the United States and the unique issues faced by local law enforcement.

CRIM 471 - Prevention and Deterrence of Crime

Credits: 3 (NR)
Theoretical and practical strategies for crime prevention and deterrence. Discusses social, environmental, and mechanical developments, police courts, and correctional elements of law enforcement in terms of current effectiveness and future potential for crime prevention.
CRIM 475 - Theory and Politics of Terrorism

Credits: 3 (NR)
Explores origins of terrorism, tracing development from early states to a modern mode of conflict. Presents national, regional, and global perspectives.

Equivalent to ADJ 475 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

CRIM 479 - Preparation for Internship

Credits: 3 (NR)
Preparation for internship in a justice organization or justice-related work activity. Students develop a relationship with a prospective internship sponsor and develop a plan for the internship and the research to be reported.

Equivalent to ADJ 479 (2009-2010 Catalog)

Prerequisite(s): CRIM 100.

CRIM 480 - Internship

Credits: 6-12 (RD)
Application of classroom learning to an applied justice setting. Students maintain daily journals, conduct research, and deliver written and oral reports.

Equivalent to ADJ 480 (2009-2010 Catalog)

Prerequisite(s): CRIM 100, 306, 315, 479, and approval of department.

Notes: Before enrolling, students must have a plan approved by the instructor. Seminars are held three times during the semester for discussion and oral presentation. Minimum of 45 hours of on-the-job work time required for each credit. May be repeated for a maximum of 12 credits.

Hours of Lecture or Seminar per week: 6-12
Hours of Lab or Studio per week: 0
CRIM 490 - Special Topics

Credits: 1-3 (RT)
Recent developments in the field.

Equivalent to ADJ 490 (2009-2010 Catalog)

Prerequisite(s): CRIM 100

Notes: Topics vary. May be used to fulfill requirements for different concentrations in the BS in criminology, law, and society depending on the topic. May be repeated for a maximum of 15 credits when topic is different.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

CRIM 491 - Honors Seminar I

Credits: 3 (RD)
Course includes readings, individual or group projects, and discussion of seminar papers.

Equivalent to ADJ 491 (2009-2010 Catalog)

Prerequisite(s): Acceptance to pursue honors in the major.

Notes: First of a two-course sequence; subject varies. May be repeated for a maximum of 6 credits when topic varies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 492 - Honors Seminar II

Credits: 3 (RD)
Course includes readings and discussion of seminar papers, leading to a research project under the direction of a faculty member.

Equivalent to ADJ 492 (2009-2010 Catalog)

Prerequisite(s): CRIM 491

Notes: Second of a two-course sequence. Subject varies. Oral exam on the research and report may be required. May be repeated for a maximum of 6 credits when topic varies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 495 - Capstone in Criminology, Law and Society
Credits: 3 (NR)
Provides an in-depth examination of a historical and contemporary issues facing criminology and law and society scholars. Focuses on the philosophies, practices, and procedures used by individuals and organizations and uses a variety of materials, experiences and resources.

Fulfills general education requirement in Synthesis.

**Prerequisite(s):** CRIM 100; ENGL 101/ENGH 101; ENGL 302/ENGH 302; COMM 100, or 104; 60 credits. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**CRIM 498 - Research Practicum**

Credits: 1-3 (RT)
Supervised research experience with a professor in a non-classroom setting. Offers students an opportunity to gain valuable research experience and training in research. Students are required to work 45 hours (across the semester) per credit.

**Prerequisite(s):** CRIM 100 and CRIM 315.

**Notes:** Open to majors in CRIM with 60 credits and permission of instructor and department.
May be repeated for a maximum of 6 credits.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0

**CRIM 499 - Independent Study**

Credits: 1-3 (RT)
Reading and research on a specific topic under the direction of a faculty member.

Equivalent to ADJ 499 (2009-2010 Catalog)

**Prerequisite(s):** CRIM 100 and 90 credits.

**Notes:** Open to majors in CRIM with 90 credits and permission of instructor and department. Written report is required; an oral exam or report may also be required. Degree requirements to be fulfilled by a particular independent study determined by student’s advisor. May be repeated for a maximum of 9 credits.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0

**CRIM 509 - Justice Organizations and Processes**

Credits: 3 (NR)
Examines structures, practices, and performance of organizations involved in administration of justice: law enforcement, courts
and legal agencies, corrections, regulatory and related agencies, and private organizations.

Equivalent to PUAD 509; JLCP 509 (2009-2010 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 510 - Policing in a Democratic Society

Credits: 3 (NR)
Fundamental issues in policing a democratic society: police mission, subculture, performance measurement, moral hazards, discretion, impact on crime and disorder, legitimacy, community policing, and other reforms.

Equivalent to JLCP 510 (2009-2010 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 691 - Justice Program Planning and Implementation

Credits: 3 (NR)
Examines challenges of adapting to, planning, and implementing change in justice organizations. Provides hands-on experience in conducting, planning, and implementing project.

Equivalent to PUAD 691; JLCP 691 (2009-2010 Catalog)

Prerequisite(s): CRIM 700 or PUAD 502, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 700 - Theories of Justice

Credits: 3 (NR)
Overview of ancient and modern theories of justice with application to contemporary issues involving justice system, and other social and political institutions.

Equivalent to GOVT 726; JLCP 700 (2009-2010 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 702 - Comparative Justice
Survey of justice systems and their environments in different lands and cultures. Identifies commonalities and differences among justice systems, evaluates them, and considers policy implications.

Equivalent to JLCP 702 (2009-2010 Catalog)

Prerequisite(s): CRIM 700/GOVT 726, or permission of instructor.

CRIM 703 - Restorative Justice

Credits: 3 (NR)
Covers origins of restorative justice, its principles, implications for different justice organizations and processes, and application to a variety of problems, such as family violence, human rights, and reconciliation following mass victimizations.

Equivalent to GOVT 727; JLCP 703 (2009-2010 Catalog)

Prerequisite(s): CRIM 700 or permission of instructor.

CRIM 720 - Behavior of Law

Credits: 3 (NR)
Examines development of law and law’s effect on human behavior. Reviews theories of law’s meaning and aims. Examines construction of law and investigates consequences of law and legal decisions.

Equivalent to GOVT 728; JLCP 720 (2009-2010 Catalog)

CRIM 721 - The Constitution, Criminal Procedure, and Security

Credits: 3 (NR)
Focuses on understanding legal doctrines that form basis of U.S. constitutional procedural rights and how doctrines develop, why courts rule as they do, and evaluating strengths, weaknesses of rights.

Equivalent to GOVT 713; JLCP 721 (2009-2010 Catalog)

Prerequisite(s): CRIM 720/GOVT 728 or permission of instructor.
CRIM 722 - Civil Justice

Credits: 3 (NR)
Covers understanding civil justice system, rules that govern civil justice, origins and effects, strengths and weaknesses of civil law doctrines, and processes to understand power of law to order social behavior.

Equivalent to JLCP 722 (2009-2010 Catalog)

Prerequisite(s): CRIM 720/GOVT 728 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 723 - Law and Social Control

Credits: 3 (NR)
Competing conceptions of law, political systems, and social control. Intellectual traditions behind social control, its definitions, and mechanisms for regulating public and private behavior, by both individuals and organizations in society.

Equivalent to JLCP 723 (2009-2010 Catalog)

Prerequisite(s): CRIM 720/GOVT 728 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 730 - Courts and Constitutional Law

Credits: 3 (NR)
Role, influence, and effects of U.S. courts in creating constitutional norms and interpreting them. Special attention to First and Fourteenth Amendments, Commerce Clause. Analyzes leading court cases.

Equivalent to JLCP 730 (2009-2010 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 740 - Justice Organization and Administration

Credits: 3 (NR)
Examines organization and administration of justice and security organizations. Covers organization theory and behavior as applied to justice and security organizations.

Equivalent to PUAD 790; JLCP 740 (2009-2010 Catalog)
CRIM 741 - Conduct of Justice Organizations at the Street Level

Credits: 3 (NR)
How justice organizations behave at lowest levels, where service is delivered and discretion is greatest (suspects, victims, witnesses, police officers, prison guards, parole officers, attorneys, and others who interact with the justice system).

Equivalent to PUAD 793; JLCP 741 (2009-2010 Catalog)

Prerequisite(s): CRIM 740/PUAD 790 or permission of instructor.

CRIM 742 - Leadership in Justice and Security Organizations

Credits: 3 (NR)
Examines leadership theories, and explores fundamental questions about leadership in justice and security organizations today.

Equivalent to JLCP 742 (2009-2010 Catalog)

Prerequisite(s): CRIM 740/GOVT 790 or permission of instructor.

CRIM 743 - Changing Justice and Security Organizations

Credits: 3 (NR)
Examines challenges of changing justice organizations, how changes have been successfully and unsuccessfully implemented in the past, and what change strategies appear to be the most effective.

Equivalent to PUAD 797; JLCP 743 (2009-2010 Catalog)

Prerequisite(s): CRIM 740/PUAD 790 or permission of instructor.

CRIM 749 - Issues in Justice Administration
Credits: 1-3 (RT)
Explores issues in justice administration, taking into diverse perspectives. Emphasizes using theory and evidence to evaluate different viewpoints. Course topics vary, focusing on controversial matters.

Equivalent to JLCP 749 (2009-2010 Catalog)

Prerequisite(s): CRIM 509/PUAD 509 or CRIM 700/GOVT 726, or permission of instructor.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 760 - Crime and Crime Policy

Credits: 3 (NR)
Explores relationship between crime policy and empirical evidence about etiology of crime. Includes crime measurement and trends in crime over time, effectiveness of various policy interventions.

Equivalent to JLCP 760 (2009-2010 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 761 - Politics of Crime Policy

Credits: 3 (NR)
Explores political context of crime policy. Examines influence of public opinion, interest groups, scientific community, and other political forces. In-depth, case-study comparison of several crime policies.

Equivalent to JLCP 761 (2009-2010 Catalog)

Prerequisite(s): CRIM 760/GOVT 792 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 780 - Research Methods

Credits: 3 (NR)
Introduces logic and methods of scientific inquiry in justice, law, and crime policy. Includes conceptualization of research questions, observation, measurement, research design, and principles of causality. Evaluation of extant research according to scientific principles.

Equivalent to JLCP 780 (2009-2010 Catalog)

Prerequisite(s): Undergraduate course in social science research methods or statistics, or permission of instructor.
CRIM 781 - Justice Program Evaluation

Credits: 3 (NR)
Practical exploration of assessment techniques used in evaluating need for and consequences of justice programs and policies. Design and measurement, interpreting and presenting results.

Equivalent to PUAD 791; JLCP 781 (2009-2010 Catalog)

Prerequisite(s): PUAD 511/612 CRIM 780 or two graduate-level statistics courses; or permission of instructor.

CRIM 782 - Statistics I

Credits: 3 (NR)
Focuses on descriptive and inferential statistical methods and theory with application to problems within the justice field. Explores the logic of inferential statistical methods in general and null hypothesis significance testing in particular. Covers widely used statistical procedures within the applied social sciences.

Equivalent to JLCP 782 (2009-2010 Catalog)

Prerequisite(s): An undergraduate social science research methods course or an undergraduate statistics course.

CRIM 783 - Statistics II

Credits: 3 (NR)
Focuses on the theory and application of multivariate regression methods as applied within the justice field. Topics include tests for and consequences of violating assumptions of the generalized linear model, dummy coding of categorical variables, testing of interaction effects, logistic regression, ordered and multinominal logit, and missing data analysis.

Equivalent to JLCP 783 (2009-2010 Catalog)

Prerequisite(s): CRIM 782 or a comparable course.
CRIM 790 - Research Practicum

Credits: 1-6 (RD)
Student-initiated research project supervised by faculty member. Students must work with justice organization to conduct useful research.

Equivalent to JLCP 790 (2009-2010 Catalog)

Prerequisite(s): CRIM 780, and 782; or either STAT 510 and 535 or STAT 554 and 656; or permission of instructor.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

CRIM 795 - Special Topics

Credits: 3 (RT)
Recent developments in field, or topics not covered by regularly listed courses.

Equivalent to JLCP 795 (2009-2010 Catalog)

Prerequisite(s): To be determined by instructor.

Notes: Topics vary. May be repeated for a maximum of 15 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CRIM 796 - Directed Reading

Credits: 1-3 (RT)
Independent reading at doctoral level on specific topic related to justice, law, or crime policy as agreed to by student and faculty member and approved by coordinator of CRIM program.

Equivalent to JLCP 796 (2009-2010 Catalog)

Prerequisite(s): Successful completion of 12 graduate level CRIM credits.

Notes: Repeatable.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special.
When Offered: Fall, Spring, Summer
CRIM 797 - Professionalization Seminar

Credits: 0 (NR)
Introduces doctoral students to research, scholarship and teaching practices in the field to promote their professional development.

Notes: Required for Ph.D. students.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

CRIM 799 - Master’s Thesis

Credits: 1-6 (RD)
Research on approved master’s thesis topic under direction of thesis committee with approval of chair.

Equivalent to JLCP 799 (2009-2010 Catalog)

Prerequisite(s): Submission and approval of thesis proposal.

Notes: Repeatable. Minimum 3, maximum 6 credits for doctorate. Maximum of 6 credits of CRIM 799 applicable to masters degree requirements.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

CRIM 998 - Doctoral Dissertation Proposal

Credits: 1-6 (RD)
Work on a research proposal forming basis for doctoral dissertation.

Equivalent to JLCP 998 (2009-2010 Catalog)

Prerequisite(s): Students must complete all core and analytical course degree requirements.

Notes: Repeatable. Minimum 3, maximum 6 credits for doctorate. Maximum of 27 credits of CRIM 998/999 applicable to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit only

CRIM 999 - Doctoral Dissertation Research
Doctoral dissertation research and writing under direction of student’s dissertation committee.

Equivalent to CRIM 999 (Catalog 2009-2010)

Prerequisite(s): Advancement to doctoral Candidacy

Notes: Repeatable. Minimum 12, maximum 21 credits for doctorate. Maximum of 27 credits of CRIM 998/999 applicable to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit only

Cultural Studies (CULT)

Offered by the College of Humanities and Social Sciences

CULT 320 - Globalization and Culture

Credits: 3 (NR)
Examines relationship between cultures and globalization through texts and points of view. Starting from development of capitalism, looks at age of imperialism and colonialism, finishing in present. Considers how globalization affects dynamics of cultural change. Emphasizes extraordinary role of new media and technologies in defining and shaping cultural spaces in which people live.

Prerequisite(s): 30 credits; GLOA 101 or SOCI 120.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CULT 390 - Topics in Cultural Studies

Credits: 1-3 (RT)
Topics of current interest in interdisciplinary cultural studies, covering such fields as media, popular culture, political economy, social identities, or regions in globalization.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CULT 802 - Histories of Cultural Studies
Credits: 3 (NR)
Historical survey of principal works and theories in the development of cultural studies.

Prerequisite(s): Admission to doctoral program, related master's degree, or permission of instructor.

Notes: This course is designed for PhD level students. Students in a related MA program may take this course as the capstone to their MA as they are about to matriculate into the PhD in cultural studies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

CULT 804 - Histories of Cultural Studies II

Credits: 3 (NR)
Continues the historical survey of cultural studies up to the present and assesses possibilities for future development.

Prerequisite(s): Admission to a PhD program and CULT 802 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

CULT 806 - Research Seminar in Cultural Studies

Credits: 3 (NR)
Introduces research methods in cultural studies.

Prerequisite(s): Admission to a doctoral; completion CULT 802 and CULT 804.

Notes: Specific topics vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

CULT 808 - Student/Faculty Colloquium in Cultural Studies

Credits: 1 (RD)
Forum for presentation of original and current research in cultural studies.

Prerequisite(s): Admission to doctoral program.

Notes: Students register for 1 credit per semester over a three-semester period. May be repeated for a maximum of 4 credits.

Hours of Lecture or Seminar per week: 1
CULT 810 - Culture and Political Economy

Credits: 3 (NR)
Surveys social science and humanities classics that relate cultural production and consumption to underlying political economic conditions. Includes Marx, Lukacs, Frankfurt School, semiotic neo-Marxism, productivist theories of power indebted to Foucault, Baudrillard, Bourdieu, Harvey, Jameson, Mauss, Mill, Polanyi, Sahlins, A. Smith, and Weber.

Prerequisite(s): Admission to a doctoral program, or permission of instructor.

Notes: This course is designed for the PhD student. Those students not admitted to a PhD program are required to contact the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CULT 812 - Visual Culture

Credits: 3 (NR)
Examines theories, production, consumption, and reception of visual culture. Covers film, video, visual arts, music, display, ritual, performance, performativity, and theories of the aesthetic. Includes key readings from theorists such as Adorno, Artaud, Benjamin, Brecht, Bryson, Doane, Fiske, Heath, Marcuse, Merleau-Ponty, and Sartre.

Prerequisite(s): Admission to a doctoral program, or permission of instructor.

Notes: This course is designed for the PhD student. Those students not admitted to a PhD program are required to contact the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

CULT 814 - Gender and Sexuality

Credits: 3 (NR)
Investigates notion of gender functions in maintaining and analyzing issues of social and cultural power. Examines conflicting notions of sexuality and their role in cultural signification. Seeks to explicate relationship of sexuality, gender.

Prerequisite(s): Admission to a doctoral program, or permission of instructor.

Notes: This course is designed for the PhD student. Those students not admitted to a PhD program are required to contact the instructor.

Hours of Lecture or Seminar per week: 3
CULT 816 - Science/Technology

Credits: 3 (NR)
Considers theories and major debates on culture of science, social construction of nature, and effects of technology on modern cultural forms. Includes readings from theorists such as Nietzsche, Heidegger, Horkheimer, Feyerabend, Bahro, Haraway, and Latour.

Prerequisite(s): Admission to a doctoral program, or permission of instructor.

Notes: This course is designed for the PhD student. Those students not admitted to a PhD program are required to contact the instructor.

CULT 818 - Social Institutions

Credits: 3 (NR)
Considers theories of institutional practice and social structures, from Max Weber to Michel Foucault. Covers prisons, bureaucracies, museums, schools, political parties, and social movements.

Prerequisite(s): Admission to a doctoral program, or permission of instructor.

Notes: This course is designed for the PhD student. Those students not admitted to a PhD program are required to contact the instructor.

CULT 820 - After Colonialism

Credits: 3 (NR)
Surveys racial, ethnic, caste, and national identities in colonial contexts; scientific racism in periphery and core sites; subsequent history of race, ethnic, national identities and conflicts; classical and contemporary texts by authors such as DuBois, Fanon, Gilroy, and Spivak; and particular place of issues of national, racial, and ethnic identities in contemporary cultural studies.

Prerequisite(s): Admission to a doctoral program, or permission of instructor.

Notes: This course is designed for the PhD student. Those students not admitted to a PhD program are required to contact the instructor.
CULT 860 - Special Topics in Cultural Studies

Credits: 3 (RT)
Specialized interdisciplinary topics in cultural theory and analysis.

Prerequisite(s): Admission to a doctoral program, or permission of instructor.

Notes: These courses are designed for the PhD student. Those students not admitted to a PhD program are required to contact the instructor. Topics vary. May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

CULT 870 - Independent Study

Credits: 1-3 (RT)
Reading and research on a specific topic guided by advisors, supporting the development of a Field Concentration.

Prerequisite(s): Admission to a PhD program, successful completion of all core courses, or permission of director.

Notes: May be repeated.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

CULT 880 - Field Concentration

Credits: 3 (RT)
Intensive research course, resulting in a Field Statement and oral defense.

Prerequisite(s): Admission to cultural studies doctoral program successful completion of core courses and an additional 18 credits.

Notes: Requires permission of field advisor. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall, Spring
CULT 998 - Doctoral Dissertation Proposal

Credits: 1-6 (RD)
Develop research proposal that forms basis for doctoral dissertation.

Prerequisite(s): Advancement to candidacy.

Notes: May be repeated for credit. A maximum of 6 credits may be applied to the degree. Subject to continuous registration requirement.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-6
Grading: S/NC
When Offered: Fall, Spring

CULT 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral dissertation research and writing under direction of dissertation committee.

Prerequisite(s): Completion of CULT 998, and public presentation of dissertation proposal.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NC

Dance (DANC)

Offered by the College of Visual and Performing Arts

DANC 101 - Dance Appreciation

Credits: 3 (NR)
Introduces dance as universal human activity, expression of cultural identity, and art form. Survey of global dance includes folk, ceremonial and ritual, trance, court, classical, and theatrical.

Fulfills general education requirement in arts.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

DANC 114 - Rhythmic Analysis and Music Resources for Dance

Credits: 3 (NR)
Introduces rhythmic structure, notation, and basic forms of music.
Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.

Notes: Lecture, studio.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2

DANC 118 - World Dance

Credits: 3 (RT)
Performance of a world dance form through presentation of fundamental techniques, music and culture. Area of concentration may vary to include an array of world dance forms.

Fulfills general education requirement in global understanding.

Notes: May be repeated for total 6 credits. Fulfills non-Western requirement for CHSS and COS students.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2

DANC 119 - Dance in Popular Culture: Afro-Latino Dance

Credits: 3 (RD)
Performance of a popular dance form through presentation of fundamental techniques, music, and culture. Area of concentration may vary to include an array of popular dance forms.

Fulfills general education requirement in arts.

Notes: May be repeated for total 6 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

DANC 120 - Special Topics in Dance

Credits: 1-3 (RT)
Rotating topic. Introduction and exploration of topical studies in dance or related study areas; topic depends on instructor.

Notes: May be repeated for total 9 credits if course content differs.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-3

DANC 125 - Beginning Modern Dance
DANC 131 - Beginning Jazz Technique

Credits: 3 (RD)
Introduces fundamentals of jazz dance technique, explores the musical and cultural traditions of jazz dance, and its historical context. Emphasizes improving anatomical awareness and alignment, increasing strength and flexibility, and developing rhythmic sensitivity. Also introduces jazz improvisation and choreography.

Fulfills general education requirement in arts.

Notes: May be repeated for 6 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

DANC 145 - Beginning Ballet

Credits: 3 (RD)
Introduces fundamental elements of ballet technique and vocabulary. Stresses learning vocabulary and movement characteristics of this highly stylized art form. Emphasizes improving anatomical awareness and alignment, increasing strength and flexibility, and developing musicality.

Fulfills general education requirement in arts.

Notes: May be repeated for total 6 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

DANC 150 - Dance Improvisation

Credits: 3 (NR)
Explores movement invention and discovery. Movement explored in relation to other art forms such as literature, painting, sculpture, and architecture; enhancing kinesthetic awareness; sensitivity to others; and the environment. Prerequisite for dance composition and choreography series.

Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.
DANC 161 - Beginning Tap Dance

Credits: 3 (RD)
Introductory exploration of rhythms and steps basic to the art form of tap dancing including its musical and cultural traditions. Emphasizes improving anatomical awareness and alignment, increasing strength and flexibility and developing rhythmic sensitivity.

Fulfills general education requirement in arts.

Notes: May be repeated for total 6 credits.

DANC 170 - Orientation to Dance Production

Credits: 1 (NR)
Introduces sound, lighting, and stage management elements and terminology as related to dance performance. Intensive workshop setting emphasizes laboratory experience.

Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.

DANC 190 - First Year Seminar

Credits: 1 (NR)
Introduction to School of Dance, CVPA, and university resources available to dance majors. Weekly meetings focus on learning about opportunities for involvement in dance, the community, and adjusting academically. Each class addresses a topic to assist dance majors to effectively transition to college life.

Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.

DANC 210 - Dynamic Alignment
Credits: 3 (NR)
Covers aspects of anatomy and kinesiology that directly apply to correct development of dance technique. Emphasizes exercise correctives and imagery to correct insufficient muscle pattern and reduce stress on the body.

Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

**DANC 225 - Beginning Intermediate Modern Dance**

Credits: 3 (RD)
Further develops knowledge, skills, and appreciation of modern dance through continued exploration of techniques, aesthetics, and creativity. Continuing the development of anatomical awareness and alignment, technical clarity, and rhythmic sensitivity.

Fulfills general education requirement in arts.

Prerequisite(s): DANC 125 or permission of instructor.

Notes: May be repeated for total 9 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

**DANC 231 - Intermediate Jazz Technique**

Credits: 3 (RD)
Further study of the concepts of jazz dance technique, and in-depth study of 21st century jazz dance forms. Emphasizes furthering anatomical awareness and alignment, developing technical clarity, rhythm and syncopation. Continues exploration of jazz improvisation and choreography.

Fulfills general education requirement in arts.

Prerequisite(s): DANC 131 or permission of instructor.

Notes: May be repeated for 12 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

**DANC 245 - Beginning Intermediate Ballet**

Credits: 3 (RD)

Further develops fundamental elements of ballet technique and vocabulary. Stresses increasing vocabulary and movement
characteristics of this highly stylized art form. Continuing emphasis on improving anatomical awareness and alignment, increasing strength and flexibility, and developing musically.

Fulfills general education requirement in arts.

**Prerequisite(s):** DANC 145 or permission of instructor.

**Notes:** May be repeated for total 9 credits.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 3

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**DANC 251 - Dance Composition I**

Credits: 3 (NR)  
Introduces basic principles for composing dance movement. Focuses on simple compositional forms as they apply to solo performer, discussion, analysis, and evaluation of artistic choices. Students maintain video and written journals to document their artistic process.

**Prerequisite(s):** DANC 150. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 3

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**DANC 252 - Dance Composition II**

Credits: 3 (NR)  
Explores compositional elements in dance as they apply to group forms. Offers continued experience in developing and manipulating movement phrases using a variety of compositional forms. Introduces conducting rehearsals and selecting music. Students discuss, analyze, and evaluate artistic choices in composition using appropriate dance arts vocabulary and terminology, and maintain video and written journals to document artistic process.

**Prerequisite(s):** DANC 150 and DANC 251. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 3

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**DANC 270 - Dance Production Lab**

Credits: 1 (RT)  
Practical experience in stage crew, sound, or lighting of dance productions through rehearsal to public performance for university dance concerts or guest artist programs.

**Prerequisite(s):** DANC 170. Prerequisite enforced by registration system.

**Notes:** May be repeated for total 6 credits.
DANC 301 - What is Dance?

Credits: 3 (NR)
Explores connections among literature, music, theater, and visual art within aesthetic framework of dance. Examines development and ideals of Western theatrical dance, and historical and social context in which they were created. Method of instruction includes lecture, discussion, and studio experiences.

Fulfills general education requirement in arts.

DANC 318 - Global Perspectives: World Dance Forms

Credits: 3 (RD)
Continued in-depth study of world dance form including technique, music, and culture. Texts, video, performances, music, participatory events, and guest artist presentations. Lecture, studio. Area of concentration varies to include as many cultures as possible.

Fulfills general education requirement in global understanding.

Prerequisite(s): DANC 118 or DANC 119; or permission of instructor. Prerequisite enforced by registration system.

Notes: May be repeated for total 6 credits.

DANC 324 - Introduction to Dance Conditioning

Credits: 1-3 (RT)
Course involves intensive rehabilitation and conditioning exercises and realignment training geared for the individual dancer. In-depth understanding of injury prevention and neuromuscular re-education are applied to ballet and modern technique classes.

Prerequisite(s): Admission to the dance major and permission of director; prerequisites enforced by registration system.

Notes: May be repeated for a total of 12 credits
DANC 325 - Intermediate Modern Dance

Credits: 1-3 (RT)

Explores intermediate level of modern dance technique. Emphasizes improving anatomical awareness, increasing strength and flexibility, expanding modern dance vocabulary, and developing flow and dynamic range.

Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.

Notes: Meets general education fine arts requirement. May be repeated for total 24 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-3

DANC 326 - Dance Performance Practicum

Credits: 0-1 (RT)
Practical experience in dance performance through rehearsal process of university dance concerts.

Prerequisite(s): Audition.

Notes: May be repeated for total 8 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0-1

DANC 331 - Advanced Jazz Dance

Credits: 3 (RD)
In-depth studio study of 21st century jazz dance forms. Continues concepts and vocabulary introduced in DANC 231, and further emphasizes alignment, technical clarity and virtuosity. Emphasizes mastery of rhythm and syncopation.

Prerequisite(s): DANC 231. Prerequisite enforced by registration system.

Notes: Meets general education fine arts requirement.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

DANC 345 - Intermediate Ballet

Credits: 1-3 (RT)
Provides continued ballet training for intermediate-level dancer. Emphasizes increasing technical proficiency, improving anatomical awareness, and developing deeper understanding of skills and principles of ballet technique and how they provide foundation to teach and perform.
**Prerequisite(s):** Admission to the dance major. Prerequisite enforced by registration system.

**Notes:** Meets general education fine arts requirement. May be repeated for 24 credits.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 1-3

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**DANC 360 - Choreography**

Credits: 3 (NR)  
Continued choreographic exploration and research, culminating in bringing completed works to production.

**Prerequisite(s):** DANC 150, DANC 251 and DANC 252. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 3

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**DANC 362 - Directed Choreography**

Credits: 1 (RT)  
Faculty-guided, individual learning experience where students learn to choreograph a dance work by auditioning dancers, costuming, staging, lighting, selecting musical accompaniment, and composing original movement material.

**Prerequisite(s):** DANC 150, DANC 251, DANC 252 and DANC 360. Prerequisite enforced by registration system.

**Notes:** May be repeated for total 6 credits.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 1

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**DANC 370 - Dance Performance**

Credits: 0-1 (RT)  
Practical experience in performance, repertory, and choreography through rehearsal and public performance of university dance concerts or guest artist programs.

**Prerequisite(s):** Audition and admission to the dance major. Prerequisite enforced by registration system.

**Notes:** May be repeated for total 12 credits.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0-1

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**DANC 371 - Residency Workshop**
DANC 372 - Advanced Dance Production

Credits: 1 (NR)
Methodology and practice of costume and lighting design, as dictated by specific needs of dance performance.

Prerequisite(s): DANC 170 and DANC 270. Prerequisite enforced by registration system.

Notes: Taught in series of workshop settings.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 1

DANC 390 - Dance History I

Credits: 3 (NR)
Examines dance as it developed as Western theatrical form from its beginnings in social and folk dance through evolution into ballet. Emphasizes romantic and classical ballet. Also studies American dance forms as they evolved in spectacles, burlesques, minstrelsy, and social dance. All forms of dance placed in social, political, cultural, aesthetic, and historical contexts.

Fulfills general education requirement in arts.
Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

DANC 391 - Dance History II

Credits: 3 (NR)
Examines revolutions in transformation of 20th-century Western dance into forms and institutions that radically departed from predecessors. Development of contemporary dance carried with it reflections of the influence of technology and media as well as concept of global culture. Renewed interest in traditional dance forms acknowledges power of dance to serve as carrier of cultural and societal values. Dance forms placed in social, political, cultural, aesthetic, and historical contexts.

Fulfills general education requirement in arts.
Fulfills writing intensive requirement in the major.
DANC 399 - Independent Study

Credits: 1-3 (RT)
Individual research or creative project supervised by faculty member.

Prerequisite(s): Permission of director of School of Dance.

Notes: May be repeated for total 6 credits.

DANC 410 - Introduction to Contemporary Movement Theories

Credits: 3 (NR)
Introduction to movement theories combining somatic theory with practical application to dance training. Focus on ways somatic practices can deepen perceptual processes and influence movement aesthetics. Theories studied may include: Alexander Technique, Feldenkrais Method, Body-Mind Centering, and Ideokinesis.

Prerequisite(s): DANC 210. Prerequisite enforced by registration system.

DANC 418 - Global Dance Intensive

Credits: 1-3 (RD)
Intensive investigation of selected dance idiom within cultural and artistic contexts. Course work supplemented by participation in and observation of ambient culture. Analyzes similarities, differences, and common antecedents between selected culture and North American dance idioms.

Fulfills general education requirement in Global Understanding.

Notes: May be repeated for total 6 credits.

DANC 420 - Special Topics in Dance
Credits: 1-3 (RT)
In-depth presentation and exploration of topical studies in dance or related study areas.

Prerequisite(s): 9 credits of dance courses, or permission of instructor.

Notes: Topic depends on instructor. May be repeated for total 9 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-3

DANC 425 - Advanced Modern Dance

Credits: 1-3 (RT)

Advanced-level exploration of modern dance technique. Emphasizes refining alignment, developing ability to self-correct, and replicating sophisticated movement sequences. Preparation to enter professional field of dance.

Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.

Notes: Meets general education fine arts requirement. May be repeated for 18 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-3

DANC 445 - Advanced Ballet

Credits: 1-3 (RT)
Provides preprofessional ballet training for advanced-level dancer. Emphasizes attainment of high-quality technical and performance skills, application of anatomical principles, and mastery of sophisticated classical movement sequences.

Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.

Notes: Meets general education fine arts requirement. May be repeated for 18 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-3

DANC 453 - Teaching Creative Movement

Credits: 3 (NR)
Provides theory, methodology, and practicum experience in preparation for teaching creative movement to children K-12, with some application to special populations.

Prerequisite(s): Admission to the dance major. Prerequisite enforced by registration system.
DANC 454 - Methods of Teaching Dance

Credits: 3 (NR)
Examines dance pedagogy, focusing on principles needed for teaching sound technique. Students learn skills, methods, and instructional procedures for classroom. Emphasizes curriculum development, proper course sequencing, implementation of teaching strategies, and classroom management techniques. Students study teaching methods appropriate for K-12, gifted and talented, and special-needs students. Intensive practice in implementing these skills includes lab, field-teaching experiences.

Prerequisite(s): Admission to the dance major; senior standing; prerequisite enforced by registration system.

DANC 455 - Teaching Practicum

Credits: 1-6 (RT)
Full semester of supervised teaching experience in approved school or studio dance program. Credits based on number of teaching contact hours per week.

Prerequisite(s): Admission to the dance major; completion of all coursework required for teaching licensure; prerequisite enforced by registration system.

Notes: May be repeated for total 12 credits.

DANC 480 - Introduction to Laban Movement Analysis

Credits: 3 (NR)
Introduces components of laban movement analysis: body, shape, effort, and space. Includes motif writing for recording and analyzing movement.

Prerequisite(s): DANC 210. Prerequisite enforced by registration system.

DANC 490 - Senior Dance Seminar

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Culminating seminar devoted to analyzing and synthesizing knowledge and skills gained through undergraduate course work as it applies to dance, arts education, and professional development. Students develop senior project including written and oral presentation in public forum.

Fulfills general education requirement in synthesis.

**Prerequisite(s):** Admission to the dance major; senior standing; prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**DANC 501 - Graduate Dance Seminar**

Credits: 1-3 (RD)  
Presentation and discussion of current issues in dance specific to education, research, and professional development in the field.

**Prerequisite(s):** Admission to MFA in dance program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**DANC 510 - Contemporary Movement Theories**

Credits: 3 (RD)  
In-depth study of movement theories combining somatic theory with practical application to dance training. Focus is on ways somatic practices can deepen perceptual processes and influence movement aesthetics.

**Prerequisite(s):** Admission to Dance MFA program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**DANC 520 - Special Topics in Dance**

Credits: 1-3 (RT)  
In-depth presentation and exploration of topical studies in dance and/or related study areas.

**Prerequisite(s):** Admission to Dance MFA program.

**Notes:** Topic depends on instructor. May be repeated for total 9 credits.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0
DANC 525 - Advanced Modern Dance

Credits: 1-3 (RT)
Advanced study of modern technique, emphasizing sophisticated technical ability and performance skills, includes comparison of pedagogical perspectives.

Prerequisite(s): Admission to Dance MFA program.

Notes: May be repeated for total 18 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-3

DANC 545 - Advanced Ballet

Credits: 1-3 (RT)
Advanced study of ballet technique with an emphasis on high technical ability, performance skills and ballet vocabulary, includes comparison of pedagogical perspectives.

Prerequisite(s): Admission to Dance MFA program.

Notes: May be repeated for total 18 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-3

DANC 560 - Advanced Choreography

Credits: 3 (RT)
Intensive study and exploration of choreographic forms.

Prerequisite(s): Admission to Dance MFA program.

Notes: May be repeated for 12 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

DANC 562 - Directed Choreography

Credits: 3 (RD)
Creation of original work including conception and development through rehearsal process, culminating in public presentation.

Prerequisite(s): Admission to Dance MFA program.

Notes: May be repeated for 9 credits.
DANC 570 - Advanced Dance Performance

Credits: 1-3 (RD)
Public performance/presentations in university or professional productions.

Prerequisite(s): Admission to Dance MFA program.

Notes: May be repeated for total 12 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3-9

DANC 571 - Residency Workshop

Credits: 3 (RD)
Rehearsal direction of a new or restaged work by a guest choreographer in an intensive rehearsal process.

Prerequisite(s): Admission to Dance MFA program.

Notes: May be repeated for 9 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

DANC 580 - Laban Movement Analysis

Credits: 3 (NR)
Introduction to the components of Laban Movement Analysis: body, shape, effort and space.

Prerequisite(s): Admission to Dance MFA program.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

DANC 598 - Philosophy and Aesthetics of Dance

Credits: 3 (NR)
Study of philosophical theories and aesthetic principles of dance as a performing art.
Prerequisite(s): DANC 390 and 391, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

DANC 599 - Independent Study

Credits: 3 (RT)
Individual research or creative project.

Prerequisite(s): Admission to Dance MFA program.

Notes: May be repeated for total 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

DANC 615 - Contemporary Trends

Credits: 3 (NR)
Study of contemporary art and artists and their philosophical theories, aesthetics and practices as they relate to the creation of new work.

Prerequisite(s): Admission to Dance MFA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

DANC 627 - Advanced Teaching Seminar

Credits: 3 (NR)
Discussion and readings from varied pedagogical theories examining diverse approaches to teaching technique and theory culminating in development of a teaching portfolio.

Prerequisite(s): Admission to Dance MFA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

DANC 672 - Dance Production

Credits: 3 (RD)
Artistic Direction of university or professional performance including mentoring of choreographers, adjudication of work,
coordination with lighting designer, costumer, sound technician and managing director.

**Prerequisite(s):** Admission to Dance MFA program.

**Notes:** May be repeated for 6 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**DANC 680 - Dance Management**

Credits: 3 (NR)  
Exploration of the technical, financial and economical aspects of dance management including areas of marketing, fundraising, publicity, incorporation, booking non-profit vs. profit making organizations and issues relating to current practices in the performing arts industry.

**Prerequisite(s):** Admission to Dance MFA program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**DANC 790 - Internship**

Credits: 1-3 (RD)  
In depth study in selected subject area of interest.

**Prerequisite(s):** Admission to Dance MFA program.

**Notes:** May be repeated for total 9 credits.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

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**DANC 799 - Thesis**

Credits: 1-6 (RD)  
Creation and documentation of original research including planning, performance, recording and written reflecting under direction of thesis committee.

**Prerequisite(s):** Admission to Dance MFA program.

**Notes:** May be repeated for total 6 credits.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No credit only
Early Childhood Education (ECED)

ECED 401 - Developmental Pathways of Diverse Learners, Birth-Adolescence

Credits: 3 (NR)
Examines child and adolescent development from diverse perspectives. Addresses typical and atypical physical, social, and emotional, language, and intellectual development. Explores role of individual differences and culture in understanding and interpreting child and adolescent development.

Equivalent to EDU T 411 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 402 - Foundations of Language and Literacy for Diverse Young Learners

Credits: 3 (NR)
Examines complexity of language acquisition and literacy development. Focuses on typical and atypical language development, connections between language and literacy, and diversity of communication styles in families and cultures. Emphasizes first and second language acquisition.

Equivalent to EDU T 413 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 403 - Inclusive Curriculum for Young Learners: Planning Instruction and Guidance

Credits: 3 (NR)

Equivalent to EDU T 414 (2010-2011 Catalog)

Notes: Field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer
ECED 404 - Families, Communities and Schools

Credits: 3 (NR)
Focuses on strategies for developing culturally appropriate family-professional partnerships to benefit children, including children from diverse cultural and linguistic backgrounds and children with special needs. Explores theories and research supporting a family-centered approach.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 405 - Introduction to Early Childhood Special Education

Credits: 3 (NR)
Surveys current knowledge about young children with disabilities within the context of human growth and development and learning expectations in the preschool years. Includes historical factors and legislation affecting service delivery.

Notes: Field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 406 - Medical Aspects of Physical and Sensory Disabilities of Diverse Young Learners

Credits: 3 (NR)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 422 - Developing Language, Literacy, and Communication of Diverse Young Learners

Credits: 3 (NR)
Examines strategies to develop language, literacy, and communication in young children with varying abilities. Explores the importance of adult-child interaction and the effect of bilingualism, cultural diversity, cognitive ability, and language disorders.

Equivalent to EDUT 423 (2010-2011 Catalog)
Notes: Field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 423 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches

Credits: 3 (NR)
Covers methods of service delivery for infants and toddlers with disabilities and their families. Explores key aspects of consultation, interdisciplinary collaboration, service coordination, and family-centered services. Focuses on culturally responsive practices.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 497 - Special Topics in Early Childhood Education

Credits: 1-3 (RT)
Provides study on selected topic or emerging issue in Early Childhood Education.

Notes: May be repeated for credit with ECE program permission.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 501 - Developmental Pathways of Diverse Learners, Birth-Adolescence

Credits: 3 (NR)
Examines child and adolescent development from diverse perspectives. Addresses typical and atypical physical, social, and emotional, language, and intellectual development. Explores role of individual differences and culture in understanding and interpreting child and adolescent development.

Equivalent to EDUT 511 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 502 - Foundations of Language and Literacy for Diverse Young Learners
Credits: 3 (NR)
Examines complexity of language acquisition and literacy development. Focuses on typical and atypical language development, connections between language and literacy, and diversity of communication styles in families and cultures. Emphasizes first and second language acquisition.

Equivalent to EDUT 513 (2010-2011 Catalog)

**ECED 503 - Inclusive Curriculum for Young Learners: Planning Instruction and Guidance**

Credits: 3 (NR)

Equivalent to EDUT 514 (2010-2011 Catalog)

**Notes:** Field experience required

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**ECED 504 - Families, Communities, and Schools**

Credits: 3 (NR)
Focuses on strategies for developing culturally appropriate family-professional partnerships to benefit children, including children from diverse cultural and linguistic backgrounds and children with special needs. Explores theories and research supporting a family-centered approach.

Equivalent to EDUT 515 (2010-2011 Catalog)

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

**ECED 505 - Introduction to Early Childhood Special Education**

Credits: 3 (NR)
Surveys current knowledge about young children with disabilities within the context of human growth and development and learning expectations in the preschool years. Includes historical factors and legislation affecting service delivery.

**Notes:** Field experience required.
ECED 506 - Medical Aspects of Physical and Sensory Disabilities of Diverse Young Learners

Credits: 3 (NR)

Equivalent to EDSE 558 (2011-2012 Catalog)

ECED 511 - Assessment of Diverse Young Learners

Credits: 3 (NR)
Examines types of assessment for planning and implementing effective preschool through third-grade programs across content areas for culturally, linguistically, and ability diverse children. Addresses selection, administration, analysis, and interpretation of formal and informal assessments.

Equivalent to EDUT 612 (2010-2011 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.

ECED 512 - Language and Literacy Assessment and Instruction for Diverse Young Learners

Credits: 3 (NR)
Examines ways to assess and develop reading, writing, listening, and speaking in preschool through third-grade classrooms. Addresses instructional strategies and practices that promote language and literacy development in culturally, linguistically, and ability diverse children.

Equivalent to EDUT 613 (2010-2011 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.
ECED 513 - Curriculum Across the Content Areas for Diverse Young Learners

Credits: 3 (NR)
Explores assessment, curriculum development, planning, and instructional practices across content areas. Examines strategies for guiding children's behavior, integrating instruction across content areas, and planning and implementing community of learners inclusive of children with diverse disabilities.

Equivalent to EDUT 614 (2010-2011 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor; ECED 503 Inclusive Curriculum for Young Learners: Planning Instruction and Guidance.

Corequisite(s): ECED 790 Internship in Early Childhood Education

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ECED 514 - Mathematics and Science for Diverse Young Learners

Credits: 3 (NR)
Examines ways to foster development of mathematics and science in preschool to third-grade children. Covers construction of math and science lessons and hands-on experiences that address the needs of culturally, linguistically, and ability diverse children.

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.

Notes: Field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ECED 521 - Family-Centered Assessment of Diverse Young Learners

Credits: 3 (NR)
Examines types of assessment, including family-centered assessment, used for planning and implementing effective programs for children from diverse cultures and with varied learning needs. Addresses selection, administration, and interpretation of formal and informal assessments.

Equivalent to EDSE 656 (2011-2012 Catalog); EDUT 522 (2010-2011 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.
ECED 522 - Developing Language, Literacy, and Communication of Diverse Young Learners

Credits: 3 (NR)
Examines strategies to develop language, literacy, and communication in young children with varying abilities. Explores the importance of adult-child interaction and the effect of bilingualism, cultural diversity, cognitive ability, and language disorders.

Equivalent to EDSE 556 (2011-2012 Catalog); EDUT 523 (2010-2011 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.

ECED 523 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches

Credits: 3 (NR)
Covers methods of service delivery for infants and toddlers with disabilities and their families. Explores key aspects of consultation, interdisciplinary collaboration, service coordination, and family-centered services. Focuses on culturally responsive practices.

Equivalent to EDUT 524 (2010-2011 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.

ECED 524 - Families of Children with Special Needs

Credits: 3 (NR)
Focuses on strategies for developing culturally appropriate family-professional partnerships to benefit children with special needs. Explores theories and research supporting a family-centered approach. Includes family and professional rights and responsibilities in the special education process.

Equivalent to EDSE 615 (2011-2012 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.
ECED 585 - Research in Early Childhood Education

Credits: 3 (NR)
Develops fundamental concepts, principles, and methods of research in early childhood education, with emphasis on interpreting and applying research results. Critiques research and uses findings in educational settings.

ECED 591 - Policy Perspectives in Early Childhood Education

Credits: 3 (NR)
Explores historical and current trends and issues involving legislation and policy in early childhood education, multilingual education, early childhood special education, and multicultural education. Focuses on historical role of social advocacy, development of advocacy skills, and collaboration and consultation with other professionals and staff in early childhood education. Provides understanding of continuum of services and context of service delivery.

Equivalent to EDUT 782 (2010-2011 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.

ECED 597 - Special Topics in Early Childhood Education

Credits: 1-3 (RT)
Provides study on selected topic or emerging issue in Early Childhood Education.

Notes: May be repeated for credit with ECE program permission.

ECED 601 - Frameworks for Early Childhood Education
Analyzes foundational frameworks for developing perspectives for working with culturally, linguistically, and ability diverse young learners, birth to age 8, and their families. Examines foundational work from fields of early childhood education, early childhood special education, multicultural education, and second language acquisition and bilingual education.

Equivalent to EDUT 781 (2010-2011 Catalog)

Prerequisite(s): Must be taken with or after final course of program.

Notes: Must be taken as final course or with final courses of the program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 790 - Internship in Early Childhood Education

Credits: 1-6 (RD)
Enables students to participate full time in an internship in early childhood education. Links university course work to real world of working with diverse young learners and their families.

Equivalent to EDUT 790 (2010-2011 Catalog)

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Spring

ECED 791 - Internship in Early Childhood Special Education

Credits: 1-6 (RD)
Enables students to participate full time in an internship in early childhood special education. Links university course work to real world of working with diverse young learners and their families.

Prerequisite(s): Admission to the Early Childhood Education program or approval of course instructor.

Notes: Students enroll in both infant/toddler (3 credits) and preschool (3 credits) internships.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Spring

ECED 792 - Internship in Early Childhood Education-TFA
ECED 801 - Current Research and Trends in Early Childhood Education

Credits: 3 (RT)
Examines research and trends in the early education of children. Explores issues that influence the education of young children with special education needs and children from culturally, linguistically, and economically diverse backgrounds. Examines practices appropriate for diverse young learners.

Prerequisite(s): Admission to the PhD in Education program or post-master’s status and approval of course instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 802 - Cognition, Language, and Literacy for Diverse Young Learners

Credits: 3 (RT)
Examines research and practice related to cognition, language, and literacy in the early education of diverse learners, including special education and multicultural/multilingual education.

Prerequisite(s): Admission to the PhD in Education program or post-master’s status and approval of course instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECED 803 - Personnel Preparation and Professional Development in Early Childhood Education

Credits: 3 (NR)
Explores research and current recommended practices related to professional development and teacher education in Early Childhood Education, birth through grade 3, including children with special education needs and those from culturally, linguistically, and economically diverse backgrounds. Provides opportunity for practical application with preservice or inservice early educators.

Prerequisite(s): Admission to the PhD in Education program or post-master’s status and approval of course instructor.
**ECED 804 - Family Research and Practice in Early Childhood Education**

Credits: 3 (NR)
Explores the relationship between families and professionals in providing appropriate early care and education, birth through grade 3, including children with special education needs and those from culturally, linguistically, and economically diverse backgrounds. Includes in-depth study, analysis, and discussion of original research as well as syntheses of findings.

Prerequisite(s): Admission to the PhD in Education program or post-master’s status and approval of course instructor.

**Economics (ECON)**

Offered by the College of Humanities and Social Sciences

Individual courses taken for credit under their former numbers may not be repeated for credit under their present numbers. A grade of C or better in ECON 103 and 104 is prerequisite to upper-division economics courses.

**ECON 100 - Economics for the Citizen**

Credits: 3 (NR)
Not available to economics majors. Broad introduction to economic concepts and how they can contribute to a better understanding of the world around us. Applies and develops concepts to current economic and social problems and issues. Less formal modeling than in the 103-104 sequence.

Fulfills general education requirement in social and behavioral science.

**ECON 103 - Contemporary Microeconomic Principles**

Credits: 3 (NR)
Introduces microeconomics in the context of current problems. Explores how market mechanism allocates scarce resources among competing uses; uses supply, demand, production, and distribution theory to analyze problems.

Fulfills general education requirement in social and behavioral science.
ECON 104 - Contemporary Macroeconomic Principles

Credits: 3 (NR)
Introduces macroeconomics in the context of current problems. National income analysis, money and banking, economic growth and stability, unemployment, inflation, and role of government.

Fulfills general education requirement in social and behavioral science.

Prerequisite(s): ECON 103.

ECON 105 - Environmental Economics for the Citizen

Credits: 3 (NR)

Introduction to economic concepts and how they can be applied to environmental policy issues such as air and water pollution, climate change, natural resource use, and sustainability. Focus is on concepts, policy, and case studies rather than formal modeling exercises.
Designated a Green Leaf Course.

Fulfills general education requirement in social and behavioral science.

ECON 110 - Introduction to Economic Science

Credits: 2 (NR)
Introduces economics as an observational science, covering personal vs. impersonal exchange, strategic interdependence and game theory, group decision making, and market design.

Fulfills general education requirement in social and behavioral science (ECON 110 and 111 must be taken in sequence).

Notes: Registration is controlled; contact instructor for guidelines.

ECON 111 - Laboratory Methods in Economics
Credits: 1 (NR)
Enables participation in experimental economics research by recruiting subjects, writing experiment instructions, and monitoring sessions.

Fulfills general education requirement in social and behavioral science (ECON 110 and 111 must be taken in sequence).

Notes: Registration is controlled; contact instructor for guidelines.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3

**ECON 306 - Intermediate Microeconomics**

Credits: 3 (NR)
Basic factors of price and distribution theory: analysis of demand, costs of production and supply relationships, and price and output determination under various market structures.

Prerequisite(s): ECON 103 and 104, and MATH 108 or 113.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 308 - Managerial Economics and Strategy**

Credits: 3 (NR)
Analysis of major strategic business situations including pricing strategy, incentives and contracts, game theory, and vertical and horizontal integration.

Prerequisite(s): ECON 306.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 309 - Economic Problems and Public Policies**

Credits: 3 (NR)
Economic problems in light of current and proposed public policies. Topics include environmental issues, international trade policies, and regulatory issues and their historical roots.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other general education courses. ECON 100 or 103 and 104 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**ECON 310 - Money and Banking**

Credits: 3 (NR)
Monetary, commercial, and central banking systems, with particular emphasis on their relationship with American government programs, fiscal policies, and controls.

Prerequisite(s): ECON 103 and 104, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 311 - Intermediate Macroeconomics**

Credits: 3 (NR)
Aggregate economic accounts, including measuring national income; determinants of levels of income and output; and causes and solutions for problems of unemployment, inflation, and economic growth.

Prerequisite(s): ECON 103 and 104, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 320 - Labor Problems**

Credits: 3 (NR)
Explores American labor unions and their effect on society, including causes of and proposed solutions to selected problems.

Prerequisite(s): ECON 103 and 104, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 321 - Economics of Labor**

Credits: 3 (NR)
Defines factors that determine levels of wages and employment, and economic consequences. Emphasizes recent developments in unionism, collective bargaining, and industrial technology.

Prerequisite(s): ECON 306.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECON 330 - Public Finance

Credits: 3 (NR)
Covers intergovernmental financial relationships; types, incidences, and consequences of taxation; other sources of governmental income; governmental expenditures and their effect; public economic enterprises; public borrowing; and debt management and its economic effect.

Prerequisite(s): ECON 306 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 335 - Environmental Economics

Credits: 3 (NR)

Microeconomic analysis of environmental problems. Topics include externalities and market failure, alternative solutions and policies, problems in monitoring and enforcement, economic analysis of development of legislation and regulation, and applications to current policy issues.
Designated a Green Leaf Course.

Prerequisite(s): ECON 103 and 104

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 340 - Introduction to Mathematical Economics

Credits: 3 (NR)
Mathematical treatment of theory of firm and household behavior, stabilization policy, growth theory, input-output analysis, and linear programming.

Prerequisite(s): ECON 306 and 311, and MATH 113; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 345 - Introduction to Econometrics

Credits: 3 (NR)
Modern statistical techniques in estimating economic relations.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ECON 306, ECON 311, and STAT 250 and STAT 350 or STAT 344 and STAT 354.
ECON 350 - Regional and Urban Economics

Credits: 3 (NR)
Regional development and metropolitan growth, including locational decisions of households and firms, and problems associated with high-density urban economic activity.

Prerequisite(s): ECON 306 or permission of instructor.

ECON 355 - The Political Economy of Nonprofit Institutions

Credits: 3 (NR)
Applies the basic principles of economics to teach students to think critically about nonprofit institutions. Examines the economics of nonprofit institutions, how incentives influence the evolution of charities, and current issues in nonprofit organizations.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ECON 103 and ECON 104 or permission of instructor.

ECON 360 - Economics of Developing Areas

Credits: 3 (NR)
Economic growth characteristic of developing countries. Economic development, obstacles to development, policies, and planning.

Fulfills general education requirement in global understanding.

Prerequisite(s): ECON 103 and 104, or permission of instructor.

ECON 361 - Economic Development of Latin America
ECON 352 - Economic Development, Institutions, and Problems of Latin America

Credits: 3 (NR)
Economic development, institutions, and problems of Latin America.

Fulfills general education requirement in global understanding.

Prerequisite(s): ECON 103 and 104, or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 362 - African Economic Development

Credits: 3 (NR)
Issues of economic development as applied to Africa. Includes overview of early economic history in Africa and post-independence development, and contemporary development problems.

Fulfills general education requirement in global understanding.

Prerequisite(s): ECON 103 and 104.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 365 - Topics in Economic History

Credits: 3 (RT)
Possible topics include ancient, medieval, modern European, and American economic history, using econometric analysis as necessary.

Fulfills writing intensive requirement in the major.

Prerequisite(s): ECON 103 and 104.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 370 - Economics of Industrial Organization

Credits: 3 (NR)
Factors influencing industrial structure, and industrial conduct and performance.
Prerequisite(s): ECON 306, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 374 - Health Economics**

Credits: 3 (NR)
Microeconomic analysis of health and medicine. Topics include the determinants of health, health externalities, health insurance, the health effects of medicine, the supply and demand of medicine, medical quality and regulation, and information asymmetries.

Prerequisite(s): ECON 306 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 380 - Economies in Transition**

Credits: 3 (NR)
Examines problems and achievements of formerly communist and socialist countries including China, Eastern European countries, and Russia and other countries of the former Soviet Union as they transition to more market-oriented economies. Includes market economics and central planning.

Fulfills general education requirement in global understanding.

Prerequisite(s): ECON 103 and 104, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 385 - International Economic Policy**

Credits: 3 (NR)
Introduces economic way of thinking on trade and international finance. Presents historical and current information on consequences of trade and protectionism.

Notes: May not be applied toward the elective course requirement needed for a major or minor in economics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 390 - International Economics**
Credits: 3 (NR)
Foreign exchange market, balance of payment, foreign trade policies, and theories of international trade.

Fulfills general education requirement in global understanding.

Prerequisite(s): ECON 306 and 311, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 403 - Austrian Economics

Credits: 3 (NR)
Microeconomic and macroeconomic models and misallocation of resources.

Prerequisite(s): ECON 306 and 311.

Notes: Alternative economic tools from noted Austrian economists.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 410 - Public Choice

Credits: 3 (NR)
Applies economic theory, methodology to study nonmarket decision making.

Prerequisite(s): ECON 306.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 412 - Game Theory and Economics of Institutions

Credits: 3 (NR)
Introduces game theory and its relevance for analyzing framework of rules and institutions within which economic processes occur. Applies game theoretical concepts to comparative analysis of causes and effects of alternative institutional arrangements.

Prerequisite(s): ECON 306 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 415 - Law and Economics
Credits: 3 (NR)
Economic analysis of the law. Topics include introduction to legal institutions and legal analysis; application of economic concepts to the law of property, contracts and torts, criminal and constitutional law; economic efficiency of common law; and public choice perspective on the evolution of the law.

**Prerequisite(s):** ECON 306 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**ECON 420 - International Money and Finance**

Credits: 3 (NR)
Examines models of balance of payments, exchange rate behavior, and open economy macroeconomics. Includes international financial system and issues such as globalization and international financial instability.

**Prerequisite(s):** ECON 306 and 311, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**ECON 435 - Economics of Energy**

Credits: 3 (NR)
Examines various issues in the energy industry using tools from microeconomic theory, law and economics and public choice. Topics include issues related to oil, historical and current energy regulation, and environmental issues associated with energy.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** Econ 306.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Spring

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**ECON 440 - Economic Systems Design: Principles and Experiments**

Credits: 3 (NR)
Introduces design principles to develop systems to allocate resources. Students must participate in experiment demonstrations of different allocation mechanisms. They also are exposed to experimental methods in economics and market design.

Equivalent to SYST 480

**Prerequisite(s):** MATH 213.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
ECON 441 - Economic Systems Design: Case Studies and Analysis

Credits: 3 (NR)
Requires students to design and develop mechanism to specific allocation problem. Students develop analytical and working engineering models of their mechanism.

Prerequisite(s): ECON 440.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 442 - Economic Systems Design: Implementation

Credits: 3 (NR)
Involves students in developing experimental design to test proposed allocation solution. Design process includes construction of experimental parameters, treatments, and initial test in laboratory setting.

Prerequisite(s): ECON 441.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 445 - Design and Analysis of Experiments

Credits: 3 (NR)
Topics include comparing two or more treatments, and computing and interpreting analysis of variance. Discusses randomized block, Latin square, and factorial designs; and applications to economics experiments.

Prerequisite(s): STAT 250, 344; and MATH 351 or IT 250; or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 470 - Economics of regulation

Credits: 3 (NR)
Examines various issues surrounding concepts of regulation using tools from microeconomic theory and public choice. Topics include antitrust, rate regulation, policy rationales for regulation, and issues of current interest.

Fulfills writing intensive requirement in the major.

Prerequisite(s): Econ 306.

Hours of Lecture or Seminar per week: 3
ECON 481 - The Development of Economic Thought

Credits: 3 (NR)
Developments in economic thought from 1500 to the present. Emphasizes historical origins, impact on contemporary economics, and theoretical validity.

Prerequisite(s): ECON 306 and 311, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 490 - Senior Seminar on Problems in Economics

Credits: 3 (NR)
Applies economic tools to investigate problems in economics.

Prerequisite(s): ECON 306 and 311, OM 210, and 90 credits; economics majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 492 - Study Abroad

Credits: 1-6 (RD)
Study abroad under supervision of George Mason faculty. Course topics, content, and locations vary.

Notes: May be repeated for a maximum of 12 credits with permission of department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECON 496 - Special Topics in Economics

Credits: 3 (RT)
Subject matter varies.

Prerequisite(s): Varies with topic.

Notes: May be repeated for credit when topic is different.
ECON 498 - Internship

Credits: 3 (NR)
Students find economics-related internship with assistance from Career Services. Pre-internship proposal and final reflections paper required.

Prerequisite(s): 6 upper-level credits of economics, junior standing, and permission of instructor.

ECON 499 - Independent Study

Credits: 1-4 (RT)
Individual study of selected area of economics.

Prerequisite(s): Economics majors with 90 credits, and permission of both department and instructor.

Notes: Directed research paper required. May be repeated for a maximum of 6 credits.

ECON 535 - Survey of Applied Econometrics

Credits: 3 (NR)
Applied introduction to estimating economic relationships. Includes simple equation and simultaneous equation system estimation.

Prerequisite(s): OM 210, and ECON 306 and 311, or permission of instructor.

Notes: Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN. Students who take ECON 535 may not take ECON 637 for credit.

ECON 600 - Economics for Educators
Credits: 3 (NR)
Introduces current and prospective K-12 teachers to the fundamentals of economics. Prepares teachers to instruct students in the economics and personal finance course now required by the Virginia Department of Education. Supports teachers in successfully teaching the economics content of the Virginia SOLs in history and social sciences.

Prerequisite(s): Undergraduate degree.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 611 - Microeconomic Theory

Credits: 3 (NR)
Covers theory of behavior of consumers, firms, and resource suppliers; theories of choice under risk and uncertainty; partial equilibrium analysis of competitive and noncompetitive markets; general equilibrium analysis; and welfare economics. Introduces capital theory.

Prerequisite(s): Admission to master's program in economics or ECON 306 and 311, and MATH 113; or permission of instructor.

Notes: Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 612 - Microeconomic Theory II

Credits: 3 (NR)
Nature of the firm; theory of supply; and production functions, factor pricing, and supplies. Introduces microeconomic foundations of theories of public finance and public choice.

Prerequisite(s): ECON 611.

Notes: Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 615 - Macroeconomic Theory

Credits: 3 (NR)
Survey course covering monetary theory, theories of consumption and saving, budget deficits, economic growth, international finance, and monetary and fiscal policies.

Prerequisite(s): Admission to master's program in economics, or ECON 306 and 311, and MATH 113; or permission of instructor.
ECON 623 - American Economic History

Credits: 3 (NR)
Explores development of American economy and evolution of economic institutions.

Prerequisite(s): ECON 611 and 615 taken concurrently, or permission of instructor

Notes: ECON 637 recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 630 - Mathematical Economics I

Credits: 3 (NR)
Includes set theory, function, differential calculus, integration, series, and matrix algebra, with special emphasis on economic applications.

Prerequisite(s): Admission to doctoral or master's program, or ECON 306 and 311, and MATH 113; or permission of instructor.

Notes: Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 632 - Economic Systems Design Principles and Experiments

Credits: 3 (NR)
Introduces analytical and engineering principles to develop exchange systems. Students must become familiar with literature on applied mechanism design; and understand behavioral aspects of auction systems, matching, assignment and transportation problems, and information markets. Also introduces methods for testbedding systems using experimental economics and statistical design.

Prerequisite(s): Courses in linear and nonlinear optimization, and linear algebra.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 633 - Economic Systems Design Case Studies and Analysis
Credits: 3 (NR)
Students begin process of doing research in design economic exchange system. Design process includes electronic instructions, and design of information structures. Students responsible for research into economic issues, and practical design issues.

Prerequisite(s): ECON 632.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 634 - Economic Systems Design Implementation

Credits: 3 (NR)
Students do original research in economic systems design by constructing engineering model of solution to allocation problem. Research includes experimental and statistical design, and complete description of hypothesis related to construction of experimental parameters and treatments to test mechanism. Requires initial test of mechanism in laboratory setting.

Prerequisite(s): ECON 633.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 637 - Econometrics I

Credits: 3 (NR)
Techniques of estimating relationships between economic variables. Introduces multiple regression and problems associated with single equation model-autocorrelation, multicollinearity, and heteroscedasticity.

Prerequisite(s): Acceptance to PhD program in economics, or permission of instructor.

Notes: Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 676 - Comparative Economic Systems

Credits: 3 (NR)
Capitalism, socialism, and corporatism historical perspective. Includes examination of economies of representative contemporary countries.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 695 - Special Topics in Economics
Credits: 3 (RD)
Topics vary according to interests of instructor. Emphasizes new areas of discipline.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

**ECON 715 - Macroeconomic Theory I**

Credits: 3 (NR)
Covers classical, neoclassical, Keynesian, and post-Keynesian theories of income and employment determination; theories of inflation and growth; and demand for money and implications for effectiveness of monetary vs. fiscal policy.

Prerequisite(s): Admission to doctoral program in economics, or permission of instructor.

Notes: Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECON 799 - Master's Thesis**

Credits: 1-6 (RD)
Research on approved thesis topic under direction of thesis committee.

Prerequisite(s): Admission to MA economics program and permission of thesis advisor.

Notes: Students must register for a minimum of three credit hours in their first semester of 799 and maintain continuous enrollment in 799 while writing and submitting a thesis. A maximum of 6 credits of 799 may be applied to the degree.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-12
Grading: Satisfactory/No credit only

**ECON 811 - Microeconomic Theory I**

Credits: 3 (NR)
Theory and applications of behavior of consumers, firms, and resource suppliers. Partial equilibrium analysis of various market structures and introduction to intertemporal choice and capital theory. Review and analysis of classic works in microeconomic theory.

Prerequisite(s): Admission to doctoral program in economics, or permission of instructor.

Notes: Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN.
**ECON 812 - Microeconomic Theory II**

Credits: 3 (NR)
Examines nature of firm; theory of supply; and production functions, factor pricing, and supplies. Introduces microeconomic foundations of theories of public finance and public choice.

**Prerequisite(s):** ECON 811.

**Notes:** Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN.

**ECON 816 - Macroeconomic Theory II**

Credits: 3 (NR)
Aggregate economic activity and price levels with emphasis on dynamic models.

**Prerequisite(s):** ECON 715 and 811, or permission of instructor.

**Notes:** Topics vary. Contact Graduate Coordinator at econgrad@gmu.edu for permission to register and CRN.

**ECON 817 - Monetary Theory and Policy**

Credits: 3 (NR)
Theory of mechanisms through which central banking affects economic activity and prices. Analyzes demand for money and its relationship to economic activity. Develops monetary theory with emphasis on current theories and controversies in the field.

**Prerequisite(s):** ECON 615 or 715, and 535 or 637, or permission of instructor.

**ECON 820 - History of Economic Thought**

Credits: 3 (NR)
Explores major figures in history of economic thought and tools of analysis they created. Emphasizes classical, neoclassical, and Keynesian theories.
ECON 821 - History of Economic Thought II

Credits: 3 (NR)
Covers development of economic analysis from marginal revolution of 1877 to present. Emphasizes development of neoclassical economic theory.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 823 - Topics in Economic History

Credits: 3 (NR)
Offers economic analysis of various historical epochs including Industrial Revolution, evolution of political reform, rise of unions, and growth of government.

Prerequisite(s): ECON 611 and 615.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 825 - Political Economy and Public Policy I

Credits: 3 (NR)
Covers economic process of public policy formulation and implementation; and economic behavior of principals in policy making and execution.

Prerequisite(s): ECON 611 and 811, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 826 - Political Economy and Public Policy II

Credits: 3 (NR)
Specific issues related to political economy of public policy, including privatization, political economy of deficit spending, regulation and deregulation, and economics of rent seeking.

Prerequisite(s): ECON 611 or 811, 615, and 825; or permission of instructor.
ECON 827 - Economic Philosophy

Credits: 3 (NR)
Analyzes philosophical organization, including interrelations between economics and legal and political institutions; philosophical presuppositions of capitalist economy under constitutional democracy; alternative presuppositions for non-capitalist economies; and critical evaluation of history of ideas in social and moral philosophy.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

ECON 828 - Constitutional Economics

Credits: 3 (NR)
Analyzes existing and proposed elements of economic constitution. Emphasizes fiscal, monetary, transfer, and regulatory powers of government and constitutional limits on such powers, especially in the United States. Includes analysis of proposed changes in limits.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

ECON 829 - Economics of Institutions

Credits: 3 (NR)
Analyzes framework of rules and institutions for economic activities and transactions. Includes emergence and working properties of different institutions, and classical and contemporary approaches to economic theory of institutions.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

ECON 831 - Mathematical Economics II

Credits: 3 (NR)
Covers mathematical treatment of economic theories. Includes static and dynamic analysis of macromodels; input-output analysis; and optimization techniques such as Lagrangian multipliers, linear programming, nonlinear programming, and game theory.
Prerequisite(s): ECON 830 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 838 - Econometrics II

Credits: 3 (NR)
Explores econometric models and simultaneous equation systems. Includes identifying parameters and least squares bias, alternative estimation methods, and block recursive systems.

Prerequisite(s): ECON 637 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 839 - Constitutional Economics II

Credits: 3 (NR)
Uses economic analysis and methods to explore more deeply than in Constitutional Economics I specific issues in Constitutional Economics.

Prerequisite(s): ECON 828

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 840 - Law and Economics I

Credits: 3 (NR)
Uses economics to analyze U.S. Common-law system, evaluating efficiency and logic of evolution.

Prerequisite(s): ECON 611 or 811, 630 or 830, 535 or 637.

Notes: No prior knowledge of law required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 841 - Law and Economics II

Credits: 3 (NR)
Explores empirical analyses of law of property, torts, crime, and family. Also looks at law's effects on freedom and economic
growth.

Prerequisite(s): ECON 840.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 842 - Labor Economics

Credits: 3 (NR)
Formal models of labor demand, supply, utilization, and wage determination; determination of factor shares in open economy; theory of collective bargaining, and impact of trade unions on wage rates and resource allocation; measurement, types, and causes of unemployment; and cost-benefit analysis of labor training and development projects.

Prerequisite(s): ECON 611 and 615, or 715 and 811, or permission of instructor.

Notes: ECON 637 recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 844 - Industrial Organization and Public Policy I

Credits: 3 (NR)
Structure of American industry and underlying determinants. Includes structure and conduct on industrial performance in light of theory and empirical evidence; and rational antitrust policy and analysis of impact on structure and performance.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 846 - Industrial Organization and Public Policy II

Credits: 3 (NR)
Covers relationship of law, economics, and theories of social control of property rights. Includes theories of market structure and industrial performance.

Prerequisite(s): ECON 844.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 849 - Public Finance
Credits: 3 (NR)
Theoretical and institutional analysis of government expenditure, taxation, debt management, and intergovernmental fiscal relations. Includes allocative and distributional effects of alternative tax and subsidy techniques, principles of benefit cost, and cost-effectiveness analysis for government decisions.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 852 - Public Choice I

Credits: 3 (NR)
Applies economic theory and methodology to study of nonmarket decision making.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 854 - Public Choice II

Credits: 3 (NR)
Applies public choice approach to study such topics as causes and consequences of governmental growth, behavior of public bureaucracies, and economic reasoning behind constitutional limitations on size and growth of government.

Prerequisite(s): ECON 852 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 861 - Economics of the Environment

Credits: 3 (NR)
Analyzes economic models of ecosystems and pollutant discharges into environment. Includes methods of improving economic efficiency and review of public policies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 866 - Economic Development

Credits: 3 (NR)
Explores forces contributing to or retarding economic progress in developing countries. Includes role of foreign trade, economic
integration, foreign investment, multinational corporations, and technological transfers.

Prerequisite(s): ECON 611 and 615, or 715 and 811, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 869 - International Trade and Policy

Credits: 3 (NR)
Studies classical, neoclassical, and modern theories of international trade; theory and practice of world trade models such as project LINK; foreign investment and economic growth, tariffs and nontariff barriers, and economic integration; and recent developments, with emphasis on natural resources.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 871 - International Monetary Economics

Credits: 3 (NR)
Examines international adjustment mechanism, price and income effects, controls, and monetarist approach; development of international monetary system; demand for international reserves; capital movements; and role of International Monetary Fund.

Prerequisite(s): ECON 615 or 715 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 880 - Theory of the Market Process I

Credits: 3 (NR)
Examines theory developed by Menger, Mises, Hayek, and others of the Austrian School; and compares with other popular theories.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 881 - Theory of Market Process II
Credits: 3 (NR)
Continuation of ECON 880. Topics vary and include market-process approach to analyzing capital accumulation and growth; money and credit institutions; inflation and unemployment; and industrial fluctuations.

Prerequisite(s): ECON 880, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 885 - Experimental Economics

Credits: 3 (NR)
Designed for graduate students to learn how experimental methods can be used to inform economic research and practice. Students expected to have working understanding of basic economic concepts and multivariate calculus.

Prerequisite(s): ECON 611 or 811 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 886 - Experimental Economics II

Credits: 3 (NR)
Research in experimental design. Topics represent basic tools to build, test, and implement exchange mechanisms in an applied setting.

Prerequisite(s): ECON 885 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 895 - Special Topics in Economics

Credits: 3 (RT)
Topics vary according to interests of instructor. Emphasizes new areas of discipline.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECON 896 - Directed Reading and Research
Independent reading and research paper on a topic agreed on by student and faculty member.

**ECON 918 - Seminar in Monetary Theory and Policy**

Credits: 3 (NR)
Selected topics of current interest.

**Prerequisite(s):** ECON 817.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**ECON 950 - Seminar in Public Finance**

Credits: 3 (NR)
Important public finance issues treated in seminar format.

**Prerequisite(s):** ECON 849 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**ECON 985 - Workshop in Experimental Economics**

Credits: 3 (RD)
Designed for graduate students who have taken Experimental Economics and Economic Systems Design and are applying experimental methods to their own or collaborative research projects.

**Prerequisite(s):** ECON 886.

**Notes:** May be repeated for a maximum of 6 credits.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**ECON 998 - Doctoral Dissertation Proposal Research.**

Credits: 1-9 (RD)
Research on prospective dissertation topic.
Notes: For students who have completed course work but have not yet advanced to candidacy.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-9
Grading: S/NC

**ECON 999 - Doctoral Dissertation Research**

Credits: 1-15 (RD)
Research on approved dissertation topic under direction of dissertation committee.

Prerequisite(s): Admission to PhD economics program, and permission of dissertation advisor.

Notes: May be repeated; 24 credits may be applied to doctoral degree requirement.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-15
Grading: S/NC

**Education (EDUC)**

Offered by the College of Education and Human Development

**EDUC 203 - Human Disabilities in American Culture**

Credits: 3 (NR)
Provides a perspective in human disabilities in American culture through awareness, historical and political implications, and technological applications. Demonstrations, discussions, and explorations of this culture by age groups, professions, and life domains will be included.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDUC 300 - Introduction to Teaching**

Credits: 3 (NR)
Introduction to educational issues; not applicable in graduate-level teacher education programs. Examines roles of teacher, nature of American schools, and potential contributions of students.

Notes: Requires school-based field experience during course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDUC 301 - Educationally Diverse Populations: Handicapped, Gifted, Multicultural

Credits: 3 (NR)
Introduction to educational issues; not applicable in graduate-level teacher education programs. Introduces psychological, sociological, educational, and physical aspects of diverse populations in today's schools for early and middle education. Emphasizes litigation and legislation pertaining to education of diverse populations.

Notes: Requires school-based field experience during course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 302 - Human Growth and Development

Credits: 3 (NR)
Introduction to educational issues; not applicable in graduate-level teacher education programs. Examines human development through life span with special emphasis on cognitive, language, physical, social, and emotional development of children. Emphasizes contemporary theories of human development and their relevance to educational practice.

Notes: Requires school-based field experience during course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 303 - Politics of American Education

Credits: 3 (NR)
Focus on the study of the American political system. Designed for students studying the American political system and students interested in careers in education. Explores how interactions between various levels and branches of government affect education.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 372 - Human Development, Learning, and Teaching

Credits: 3 (NR)
Explores processes that influence intellectual, social, emotional, moral, ethical, and physical development of middle and high school students. Examines research and theories for understanding learning process.

Fulfills general education requirement in social and behavioral science.

Notes: School-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDUC 400 - In-Service Educational Development

Credits: 1-6 (RT)
Offered at request of school division or other educational agency.

Notes: Content varies; may be repeated for credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDUC 415 - Student Teaching in Physical Education

Credits: 12 (NR)
See PHED 415.

Prerequisite(s): Concurrent enrollment in PHED 472, completion of all courses in the approved program, and admission to and good standing in the Teacher Education Program.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 12

EDUC 422 - Foundations of Secondary Education

Credits: 3 (NR)
Analyzes philosophical assumptions, curriculum issues, learning theories, and history associated with current teaching styles. Emphasizes applications to all disciplines taught in secondary schools. Examines educational trends and issues.

Prerequisite(s): Admission to the secondary Education Program.

Notes: 15 hours school-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 500 - In-Service Educational Development

Credits: 1-6 (RT)
Offered at request of school division or other educational agency.

Notes: Content varies; may be repeated for credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special
EDUC 511 - Introduction to Education in International Schools

Credits: 3 (NR)
Explores structure and variations of international schools. Includes analysis of human growth and development, overview of educational psychology, and introduction to using technology across curriculum.

Prerequisite(s): Admission to FAST TRAIN or Permission of Instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 512 - Teaching Elementary Social Studies in International Schools

Credits: 3 (NR)
Focuses on translation of knowledge and data-gathering processes from social sciences into appropriate and meaningful K-8 social studies experiences. Develops understanding of aims and methodologies of history, geography, government and political science, sociology, anthropology, and psychology.

Prerequisite(s): Admission to FAST TRAIN or Permission of Instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 513 - Teaching Elementary Math in International Schools

Credits: 3 (NR)
Presents topics in school mathematics with particular emphasis on developing common K-8 strands for application in international schools. Focuses on exploring, verifying, and explaining concepts using concrete materials.

Prerequisite(s): Admission to FAST TRAIN or Permission of Instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 514 - Teaching Elementary Science in International Schools

Credits: 3 (NR)
Covers theory and practices of effective teaching of K-8 science in international schools. Uses laboratory and discovery techniques to design essential science components and integrate them with other disciplines. Introduces design and implementation of activities for developing concepts, solving problems, and strengthening thinking skills in K-8 science.

Prerequisite(s): Admission to FAST TRAIN or Permission of Instructor.
EDUC 516 - Language Across the Elementary International School Curriculum

Credits: 3 (NR)
Introduces current methods of teaching integrated language arts in elementary and middle school settings (K-8). Includes language and literacy development, second language acquisition, reading and writing in content areas, and children's literature. International focus considers needs of second-language learners in regular classroom settings.

Prerequisite(s): Admission to FAST TRAIN or Permission of Instructor.

EDUC 520 - Elementary Curriculum, Instruction, and Assessment in International Schools

Credits: 3 (NR)
Addresses interrelationship of instruction, curriculum, and assessment in international schools. Includes review of research and effective practice.

Prerequisite(s): Admission to FAST TRAIN or Permission of Instructor.

EDUC 521 - Foundations of Education, PK-12

Credits: 3 (NR)
Introduces various ways of educating and socialization processes in American educational institutions. Analyzes current education practices in terms of history, philosophy, psychology, and sociocultural factors of formal and informal learning. Emphasizes trends, issues, and alternative futures.

Notes: School-based field experience required. Course fulfills the Virginia Department of Education requirement for provisionally licensed teachers.

EDUC 522 - Foundations of Secondary Education
Credits: 3 (NR)
Analyzes philosophical assumptions, curriculum issues, learning theories, and history associated with current teaching styles. Emphasizes applications to all disciplines taught in secondary schools. Examines current educational trends and issues in relation to sociology of secondary school settings.

Notes: 15 hours school-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 537 - Foundations of Multicultural Education

Credits: 3 (NR)
Examines multicultural education through historical, sociological, and philosophical foundations. Emphasizes role of ethnicity in development of nation and education system. Includes overview of multicultural and multilingual curricula, and culturally and linguistically responsive instructional and assessment techniques.

Notes: Requires field experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 539 - Human Development and Learning PK-12

Credits: 3 (NR)
Provides practicing teachers with foundations of psychological theory, research, and professional practice relating to development and learning in inclusive PK-12 classroom settings.

Notes: School-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 542 - Foundations of Education

Credits: 3 (NR)
Examines the historical, philosophical, and sociological foundations of education as they relate to elementary schools, with a particular emphasis on teaching a culturally diverse population. Students will develop an understanding of the relationship between society and education.

Prerequisite(s): Admission to the Elementary Education licensure program. School-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDUC 543 - Children, Family, Culture, and Schools, 4-12 Year Olds

Credits: 3 (NR)
Examines child and family development and ways children, families, schools, and communities interrelate. Links children's developing physical, social, emotional, and cognitive abilities to planning curriculum and developing instructional strategies.

Prerequisite(s): Admission to elementary education licensure program.

Notes: Requires school-based field experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 547 - Scientific Inquiry and the Nature of Science

Credits: 3 (NR)
Incorporates understanding about scientific knowledge in K-12 classrooms. Builds fundamental knowledge of scientific inquiry and the nature of scientific knowledge and skills to weave this knowledge explicitly in curriculum. Focuses on developing inquiry-based lessons for students to investigate science and assessing student understanding of science and the nature of science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer

EDUC 597 - Special Topics in Education

Credits: 1-6 (RT)
Provides advanced study on selected topic or emerging issue in American or international education.

Prerequisite(s): Admission to program in Graduate School of Education.

Notes: May be repeated for credit with GSED permission.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDUC 598 - Directed Reading, Research, and Individual Projects

Credits: 1-6 (RT)
Presents various subjects and projects, principally by directed study, discussion, research, and participation under supervision of graduate faculty member.

Prerequisite(s): Admission to degree program, and permission of dean.

Notes: May be repeated for up to 12 credits.
EDUC 600 - Workshop in Education

Credits: 1-6 (RT)
Offers full-time workshops and weekend seminars on selected topics in education and education tour seminars.

Notes: May be repeated for credit.

EDUC 606 - Education and Culture

Credits: 3 (RD)
Uses cultural inquiry process (CIP) and web site to acquire cultural, social, and language-related perspectives on educational processes; and teaches skills to analyze educational settings and expand strategies to address puzzlements in students' own practice.

EDUC 611 - Cultural Issues in Second Language Acquisition

Credits: 3 (RD)
Explores impact of linguistic and cultural diversity among students in teaching of second language across curriculum. Draws on theoretical foundations in second language acquisition, cross-cultural communication, socio- and psycholinguistics, and educational anthropology.

Prerequisite(s): Admission to TESL or bilingual or multicultural education program, doctoral status, or permission of instructor.

EDUC 612 - Inquiry into Practice

Credits: 2 (RD)
Provides experience using research skills to foster systematic and thoughtful inquiry into classroom practice. Explores relevant classroom practice issues through critical writing, action, and research. Emphasizes cultural diversity and gender issues in research.
Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 613 - How Students Learn
Credits: 3 (RD)
Advanced course in study of learning based on research and theory from different disciplines. Focuses on increasing students' learning through study of different learning systems, and understanding each learner in context of learning process itself.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 614 - Designing and Assessing Teaching and Learning
Credits: 2 (RD)
Explores design and development of curricular, pedagogical, and assessment strategies responsive to needs and interests of students. Investigates factors that affect teaching and learning, and examines multiple ways of knowing that teachers bring to classrooms.

Prerequisite(s): Completion of EDUC 613 and 612 and concurrent enrollment in EDUC 606.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 615 - Educational Change
Credits: 2 (NR)
Explores influences on educational change at classroom, school, community, state, and national levels. Investigates implications of factors and influences that affect educational change. Analyzes influences and factors, and involves students in reflecting on their own experiences.

Prerequisite(s): EDUC 612, 613, and concurrent enrollment in EDUC 606 and 614.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 621 - Teaching and Learning in the International Baccalaureate Primary Years Program
Focuses on principles and practices of Primary Years Program (PYP) of the International Baccalaureate (IBO), organized around four areas of inquiry: curriculum processes, teaching and learning, assessment, and professional learning. Final course in preparation for IBO Practitioner Award.

Prerequisite(s): Admission to GSE, enrollment in FAST TRAIN initial licensure program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 622 - Curriculum Development across IB Programs

Credits: 3 (NR)
Explores the development of practical knowledge about the design and structure of the IB programs' curricula. Provides a foundation for understanding how the programs are implemented and how student learning developed within them is assessed.

Prerequisite(s): Admission to GSE, enrollment in FAST TRAIN IB certificate program, and completion of EDUC 621, or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 623 - Models and Strategies for Teaching and Learning in IB Schools

Credits: 3 (NR)
Focuses on the development of the capacity of teachers in IB schools to adopt appropriate teaching strategies and techniques instrumental in ensuring program learning outcomes are achieved. Furthermore, participants develop a deep understanding of the critical relationship between teaching and learning.

Prerequisite(s): Admission to GSE, enrollment in FAST TRAIN IB certificate program, and completion of EDUC 621, or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 624 - Assessment and Learning in IB Schools

Credits: 3 (NR)
Explores the essential role of assessment in teaching IB learners. Addresses formative and summative assessment practices as an integral part of the IB curriculum as well as the use of assessment for differentiation and planning.

Prerequisite(s): Admission to GSE, enrollment in FAST TRAIN IB certificate program, and completion of EDUC 621, or permission of the instructor.
EDUC 626 - Inquiry into Action: IB Teachers, Learners, and Schools

Credits: 3 (NR)
Uses the action research and qualitative process to help educational practitioners plan and complete an action research study related to IB learners, teachers, or schools. Furthermore, the course examines the social, cultural, and ethical issues of conducting research with students.

Prerequisite(s): Admission to GSE, enrollment in FAST TRAIN IB certificate program, and completion of EDUC 621, or permission of the instructor.

EDUC 627 - Contemporary Issues and Trends in IB

Credits: 3 (NR)
Focuses on current IB research, trends, and issues as well as international, national, and state/provincial legislation concerning schools and the potential impact on IB schools. Participants are prepared as leaders and advocates for IB programs and their students.

Prerequisite(s): Admission to GSE, enrollment in FAST TRAIN IB certificate program, and completion of EDUC 621, or permission of the instructor.

EDUC 634 - The Role of the School Library Media Specialist

Credits: 3 (NR)
Introduces basic concepts of library science, and professional responsibilities and ethical standards of library media specialist. Addresses this role as instructional partner and resource for students and staff.

EDUC 640 - Selection and Utilization of Library Media Materials and Equipment, Including Technology
Introduces prospective library media specialists to various uses of technology in library setting, and elements involved in media collection development.

**EDUC 641 - Reference and Bibliography**

Credits: 3 (NR)
Covers library reference process, and bibliographic tools to meet needs of library patrons seeking information.

**EDUC 642 - Organization and Technical Processing of Materials**

Credits: 3 (NR)
Emphasizes application of basic cataloging principles in bibliographic description of print and nonprint materials. Students develop procedures for organizing, cataloguing, and maintaining media collection using technological support.

**EDUC 643 - Organization Administration and Evaluation of the School Library Media Center**

Credits: 3 (NR)
Develops skills to implement effective school library media program. Focuses on management principles, interpersonal skills, and lifelong learning skills in relation to evaluating services, collection development, and public relations for school libraries.

**EDUC 644 - Production of Media and Instructional Materials**

Credits: 3 (NR)
Provides guidance and practice with available audiovisual and computer-based technology to plan, produce, and present instructional materials.
EDUC 645 - Literature for Young Adults

Credits: 3 (NR)
Provides in-depth knowledge of young adult literature, and ability to relate that knowledge to library programs.

Notes: Requires extensive reading of young adult literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 646 - Literature for Children

Credits: 3 (NR)
Develop critical abilities to select and use literature for children. Focuses on selecting materials to support curriculum and promote reading.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 670 - The Culture of Teaching

Credits: 3 (NR)
Explores roles, responsibilities, and realities of teaching in secondary schools. Examines teaching in context of contemporary educational issues, legal matters, diverse and exceptional learners, classroom management, and professional practices.

Prerequisite(s): Admission to secondary education program

Corequisite(s): Initial methods course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 671 - Schools and Culture in the Future

Credits: 3 (NR)
Focuses on relationship between schools and communities from the past to the future. Research-based education reform, ideas from futurists, and ISTE technology standards influence teacher planning for students in the 21st century.

Prerequisite(s): EDUC 522 and EDUC 670

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 672 - Human Development and Learning: Secondary Education
Explores developmental issues associated with middle and high school students, and theories that provide basis for understanding learning process. Addresses implications for designing instruction and curriculum.

**Prerequisite(s):** EDUC 522.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EDUC 674 - Assessing Learning and Teaching in the Secondary School Classroom**

Credits: 3 (NR)
Supports beginning teachers' development and design of assessment practices for promoting student learning. Focuses on individual differences and classroom, teacher, school, and cultural factors that impact assessment; different types and purposes of assessment; and relationship of assessment to national and state standards.

**Prerequisite(s):** EDUC 522 and first and advanced methods course must be completed prior to taking this class.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EDUC 675 - Research in Secondary Education**

Credits: 3 (NR)
The portfolio is submitted during the semester the candidate is enrolled in EDUC 675. Helps beginning teachers become more effective by critiquing various research paradigms, reviewing the research literature, and systematically collecting and interpreting evidence to improve practice. Emphasizes linking evidence of student learning to make informed instructional decisions.

**Notes:** This capstone class of the MEd program should be taken last.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EDUC 695 - Northern Virginia Writing Project-Service Program**

Credits: 1-3 (RT)
Offered at request of school division or other educational agency.

Equivalent to ENGH 695

**Notes:** Content varies. May be repeated with permission of department, but no more than 6 credits in EDUC 695, 695, or 699 may be applied toward master's degree.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0
EDUC 697 - Theory of Composition

Credits: 3 (NR)
Acquaints classroom teachers with current theory relating to writing and teaching composition. Focuses on making explicit participants' theories, reading works of leading theorists, and developing statement describing implications of theoretical consistency in teaching writing.

Equivalent to ENGH 697

**Prerequisite(s):** ENGL 615/ENGH 615 and ENGL 695/ENGH 695, or equivalent.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

EDUC 751 - Mentoring/Supervising Intern Teachers and Mentor Teacher Career Development

Credits: 3 (NR)
Examines multiple roles of teachers as they mentor and supervise intern teachers in schools. Covers career development, leadership, and instructional roles and strategies. Designed to assist intern teachers in their first year, and provide quality career and staff development to their mentors.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

EDUC 795 - Seminar in Brain-Compatible Teaching and Learning in Multicultural Settings

Credits: 3 (NR)
Course examines brain-compatible learning styles theories and their impact on today’s classrooms comprised of culturally, linguistically, and cognitively diverse (CLCD) learners. Situates current pedagogy and its efficacy at reaching all learners. Issues examined are those involving perception, attention, consciousness, memory and emotion. Focus is particularly placed on responsive teaching methods highlighting situated cognition, brain-based learning principles and authentic learning principles.

**Prerequisite(s):** Admission to the PhD in Education program or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

EDUC 797 - Advanced Topics in Education

Credits: 1-6 (RD)
Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.
Notes: May be repeated for credit with GSED approval.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

### EDUC 800 - Ways of Knowing

Credits: 3 (NR)  
Provides understanding of characteristic ways of knowing in various liberal arts disciplines while examining subject matter, scope, key concepts, principles, methods, and theories. Analyzes philosophical traditions underlying educational practice and research.

**Prerequisite(s):** Admission to PhD program.

**Notes:** Required course during first spring semester of study in the program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

### EDUC 802 - Leadership Seminar

Credits: 3 (NR)  
Intensive study of leadership, emphasizing decision and change processes, and assessment and development of leadership skills.

**Prerequisite(s):** Admission to PhD program.

**Notes:** Required course during first semester of study in the program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDUC 805 - Research and Scholarship in Education

Credits: 2 (NR)  
Provides an intellectual framework for research and scholarship in education, including consideration of specific scholarship of CEHD faculty as representative of the range of educational scholarship that make up the educational research community.

**Prerequisite(s):** Admission to PhD in Education Program

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

### EDUC 845 - Multilingual Learners with Special Education Needs
Credits: 3 (NR)
Examines issues surrounding identification, assessment, and instruction of multilingual learners with special education needs. Specific topics to be discussed include disproportionate representation of culturally, linguistically, and cognitively diverse learners in special education; prevention of educational underachievement; and techniques for providing culturally and linguistically responsive instruction for all learners.

Prerequisite(s): Admission to the PhD Program in Education or Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

EDUC 850 - The Study of Teaching

Credits: 3 (NR)
Explores the history and development of the search for teaching effectiveness. The course will trace the various definitions of effectiveness and the methods created to assess effectiveness.

Prerequisite(s): EDRS 810.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 851 - Research on Teacher Education

Credits: 3 (NR)
Explores the history and development of the search for effectiveness in the preparation of preservice teachers and the continuing professional development of practicing teachers. The students will examine the substance and gaps in the study of the education of educators.

Prerequisite(s): EDRS 810.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 853 - World Perspectives of Teacher Education

Credits: 3 (NR)
Focuses on the cross-cultural analysis of current U.S. and internationally based teacher preparation and continuing professional development pedagogical models, policy reforms, and their historical contexts.

Prerequisite(s): Admission to the doctoral program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDUC 870 - Education Policy: Process, Context, and Politics

Credits: 3 (NR)
Examines public policy decision-making in education at local, state, and national levels, and its impact on education institutions, students, and public. Focuses on government entities' authority over education decision-making, and resolution of competing policy arguments in political arena.

Prerequisite(s): Admission to PhD in education program, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 871 - Advanced Policy Issues in Education

Credits: 3 (NR)
In-depth analysis of selected education policy issues. Focuses on issue interactions and education-related policy actions by different levels of government.

Prerequisite(s): EDUC 870 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 872 - Social Science Research and Education Policy

Credits: 3 (NR)
Focuses on research base used to support education policy actions. Focuses on analyzing strength of this research.

Prerequisite(s): EDRS 810,811, and 812 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 873 - Education Policy: Comparative and International Perspectives

Credits: 3 (NR)
Using interdisciplinary approach, addresses education policy issues that transcend national boundaries and have implications for educators in fostering social justice and global awareness.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 874 - The Achievement Gap
Credits: 3 (NR)
Focuses on achievement gap in schools. Students research and analyze gaps in student achievement related to race and ethnicity, limited English proficiency, family background, gender, poverty, and ableism, and practices designed to close the gap.

Prerequisite(s): Admission to PhD program or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 875 - Contemporary and Emerging Issues in Education Policy

Credits: 3 (NR)
Focuses on identifying and analyzing factors that promote new initiatives in education policy agenda. Attention given to nontraditional sources of education policy initiatives.

Prerequisite(s): EDUC 870

Corequisite(s): EDUC 870

Notes: Must be admitted to PhD program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 876 - Teacher Development and Education Policy

Credits: 3 (NR)
Focuses on the impact of policy actions at the local, state, and national levels on teacher preparation and continuing professional development.

Prerequisite(s): EDUC 870 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 880 - Introduction to International Education

Credits: 3 (NR)
Using interdisciplinary approach, addresses education policy issues that transcend national boundaries and have implications for educators in fostering social justice and global awareness.

Prerequisite(s): Admission to PhD in education program or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDUC 881 - Seminar in Bilingual Education: Policy

Credits: 3 (NR)
Examines historical development of education for language minority students in United States, including federal and state legislation and court decisions. Explores policy issues regarding administrative program models, instructional approaches, curricular reform, and assessment policies for language minority students developed in response to legal mandates, legislative decisions, and school reform movement.

Prerequisite(s): Admission to PhD program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 882 - Seminar in Bilingualism and Second Language Acquisition: Theory and Research

Credits: 3 (NR)
Examines theoretical foundations of bilingual and ESL education through focus on linguistics, anthropology, sociology, psychology, and education research addressing language minority students.

Prerequisite(s): Admission to PhD program, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 883 - Seminar in Sociocultural Theory

Credits: 3 (RD)
Explores and analyzes the theoretical contributions of sociocultural theory. Focuses on the growing body of contemporary research on literacy, equity in education and emancipatory teaching for diverse students.

Prerequisite(s): Admission to PhD program in Education or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 890 - Doctoral Internship in Education

Credits: 1-6 (NR)
Interns work with appropriate staff member in cooperating school, school system, or other educational institution, agency, or setting.

Prerequisite(s): Admission to PhD program, and prior approval of advisor and PhD director.

Notes: Requires 100 hours of on-site internship completed over at least a five-week period. Up to 6 credits of EDUC 890 may be applied toward PhD degree requirements.
EDUC 892 - Social Justice and Equity in International Education

Credits: 3 (NR)
Examines ideological, cultural, and systemic structural inequities in various educational settings at national and international levels. Focuses on educational practices that promote equity and social change throughout the world.

Prerequisite(s): EDUC 880.

EDUC 893 - Seminar in Educational Anthropology

Credits: 3 (NR)
Examines theories and research from educational anthropology and educational sociology to clarify and address contemporary educational issues and concerns. Focuses on U.S. public schools, with comparative materials from other educational settings and societies.

Prerequisite(s): Admission to PhD program, or permission of instructor.

EDUC 894 - Seminar in Multicultural Education

Credits: 3 (NR)
Examines knowledge base, policy issues, and curricular and instructional features of multicultural education in United States and other countries.

Prerequisite(s): Admission to the Ph.D. in Education program or permission of instructor.

EDUC 895 - Seminar in Emerging Issues of Education

Credits: 3 (RT)
Study of selected emerging issues or problems in education. Students engage in research, study, discussion, and writing.
Notes: May be repeated for credit. Up to 6 hours of 895 course work may be applied to PhD requirements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDUC 897 - Independent Study for the Doctor of Philosophy in Education

Credits: 1-6 (RT)
Structured learning experience to extend and develop skills and knowledge relative to field of professional expertise.

Prerequisite(s): Admission to PhD program and prior approval of advisor and PhD director.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 994 - Advanced Internship in Education

Credits: 3 (NR)
Internship in setting related to student's major area of study. Requires minimum of 100 hours completed over at least a five-week period. Each intern works with appropriate staff member in cooperating school, school system, or other educational institution or agency.

Prerequisite(s): admission to PhD program, and prior approval of advisor and PhD director.

Notes: Internship must be in setting that differs from regular employment.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDUC 998 - Doctoral Dissertation Proposal

Credits: 1-6 (NR)
Prerequisite(s): Admission to candidacy in PhD program; successful completion of doctoral qualifying exam; and EDRS 810, 811, and 812 or their equivalents.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

EDUC 999 - Doctoral Dissertation Research
Credits: 1-9 (RD)
Provides continued faculty assistance on individual basis to complete dissertation planned in EDUC 998 and initiate new projects.

Notes: Requires successful completion of EDUC 998 and faculty approval of proposal.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

Education Leadership (EDLE)

Offered by the College of Education and Human Development

EDLE 412 - Schools and the Law

Credits: 3 (NR)
Provides an extensive overview of legal and ethical issues in schools. In the course, students will review and analyze key legal and ethical principles, read court decisions, and examine federal and state statutes.

Prerequisite(s): EDUC 300. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDLE 420 - Organization and Management of Schools

Credits: 3 (NR)
Studies basic issues in leadership, organization, and governance of schools. Explores theories and models of leadership how leaders conceptualize school organization, with an emphasis on distributed leadership in professional environments, systems thinking, and organizational change.

Prerequisite(s): EDUC 300 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDLE 597 - Special Topics in Education

Credits: 1-6 (RD)
Provides advanced study on selected topic or emerging issue in American or international education.

Prerequisite(s): Admission to program in GSE.

Notes: May be repeated for credit with GSE permission.
EDLE 610 - Leading Schools and Communities

Credits: 3 (NR)
Examines critical functions of leadership and organizational management, complex decision making responsibilities of school executives, and constructive relationships between schools and communities. Incorporates historical, ethical, philosophical, and sociological foundations of American education and the impact of organizational structure on reform and student achievement. Practical and academic emphasis on leadership skill development and dispositions.

Prerequisite(s): EDLE 620 or EDSE 743; EDLE 690; EDLE 791; EDLE 612; EDLE 614 or EDSE 702; EDLE 616 or EDSE 626, and EDLE 618.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDLE 612 - Education Law

Credits: 3 (NR)
Provides legal foundations of U.S. public schools. Examines general principles of statutory and case law, and applies judicial decisions to educational environments. Focuses on legal responsibilities, constraints, and opportunities of public school officials. Includes component of Special Education law.

Prerequisite(s): EDLE 620 or EDSE 743; EDLE 690 and EDLE 791.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDLE 614 - Managing Financial and Human Resources

Credits: 3 (NR)
Explores basic functions in financial and human resource management. Examines legalities, ethics, and politics of resource procurement and allocation. Provides experiences to help students better understand tasks typically performed by school leaders.

Prerequisite(s): EDLE 620, EDLE 690, and EDLE 791.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDLE 616 - Curriculum Development and Evaluation
Credits: 3 (NR)
Examines the relationship of the written, taught, and tested curriculum and identifies critical leadership decisions that can positively impact student achievement. Identifies components of effective curriculum guides. Mini-document for personal use is constructed.

Prerequisite(s): EDLE 620, EDLE 690, and EDLE 791

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDLE 618 - Supervision and Evaluation of Instruction**

Credits: 3 (NR)
Provides a theoretical and practical overview of the supervision and evaluation of instruction. Introduces the domains of supervision and inquiry into current issues and best practices in supervision. Uses a variety of interactive exercises to assist in the development of practical skills for using the clinical process and developmental approach to supervision.

Prerequisite(s): EDLE 620 or EDSE 743; EDLE 690, and EDLE 791

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDLE 620 - Organizational Theory and Leadership**

Credits: 3 (NR)
Studies basic organizational theories and models of leadership and management. Emphasizes shared leadership in professional environments, communication skills, systems thinking, and personal and organizational change. Bridges theory to practical applications in educational settings.

Corequisite(s): Application to the Education Leadership Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDLE 634 - Contemporary Issues in Education Leadership**

Credits: 3 (NR)
Examines current and emerging issues and trends impacting education. Includes demographic shifts; globalization; technology; data-based decision making; inclusion of diverse learners in American schools; and recent research on student achievement when influenced by race, gender, and poverty.

Prerequisite(s): Admission to program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDLE 636 - Adult Motivation and Conflict Management in Education Settings: A Case Study Approach

Credits: 3 (NR)
Uses case studies and simulations to examine conflict mediation and resolution skills, and safety and security issues. Focuses on character and ethics education in schools, coaching and mentoring, and adult motivation to support positive behaviors in work settings.

Prerequisite(s): Admission to program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDLE 690 - Using Research to Lead School Improvement

Credits: 3 (NR)

Develops skills, insights, and understanding of how leaders use research to improve schools, with emphasis on the use of assessment and research data to identify school improvement needs and to design school improvement projects. Designated a Green Leaf Course.

Prerequisite(s): EDLE 620 or 743 (may be taken concurrently if application has been submitted to the MEd in Education Leadership program or the MEd in EDLE with a Concentration in Special Education Leadership program)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDLE 770 - Introduction to Education Leadership

Credits: 3 (NR)
Introduces the study of education leadership, theoretical traditions in leadership studies, and scholarship on leadership and organizational change.

Prerequisite(s): Admission to Ph.D. in Education Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

EDLE 791 - Internship in Educational Leadership

Credits: 3 (NR)
Offers wide range of practical experiences and professional challenges in authentic educational settings. Activities emphasize strategic, instructional, organizational, political, and community leadership.
**Prerequisite(s):** Admission to the MEd in Education Leadership (EDLE) program or MEd in EDLE with a concentration in Special Education Leadership; EDLE 620 or 743 (may be taken concurrently)

**Notes:** Course must be taken in second term of program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit

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**EDLE 797 - Advanced Topics in Education**

Credits: 1-9 (RT)  
Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.

**Notes:** May be repeated for credit with CEHD approval.

**Hours of Lecture or Seminar per week:** 1-9  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

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**EDLE 801 - Contemporary Organization Theory**

Credits: 3 (NR)  
Engages students in the study of major organization theories that inform educational leadership research. Students use theory to help inform their own research interests. Students begin work on analytical literature review.

**Prerequisite(s):** Admission to PhD in education program.

**Corequisite(s):** EDLE 802.

**Notes:** May be taken as corequisite with EDLE 802. First in three-course sequence.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

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**EDLE 802 - Leadership and Decision Making**

Credits: 3 (NR)  
Engages students in the study of major leadership and decision theories that inform educational leadership research. Students use theory to help inform their own research interests. Students begin work on analytical literature review.

**Prerequisite(s):** EDLE 801.

**Notes:** May be taken as corequisite with EDLE 801. Second in three course sequence.
EDLE 803 - Foundations of Education Leadership: Economics and Leadership

Credits: 3 (NR)
Emphasizes economic foundations of U.S. education, and evolution of school, district, and state leadership. Students complete work on analytical literature review.

Prerequisite(s): EDLE 801 and 802.

Notes: Third in a three-course sequence.

EDLE 813 - Social and Political Forces in Education Leadership

Credits: 3 (NR)
Examines the social and political forces that shape education in the United States and the effect of these forces on school leadership. Examines the social and political functions of schooling in the past and present.

Prerequisite(s): Admission to Ph.D. in Education Program.

EDLE 815 - Conceptual Frameworks in Education Leadership

Credits: 3 (NR)
Introduces three different disciplinary perspectives on education leadership, and helps identify and articulate different conceptual frameworks. Major focus is designing a conceptual framework that informs research questions.

Prerequisite(s): Admission to PhD in education program or permission of instructor

EDLE 816 - Instructional Leadership-Curriculum Policy and Practice

Credits: 3 (NR)
Focuses on curriculum and instruction theory, policy, and practice with research emphasis on instructional leadership. Students
develop research proposals to investigate instructional leadership in schools and districts, and relate instructional leadership to their own specific research interests.

**Prerequisite(s):** Admission to Ph.D. in Education Program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

### EDLE 818 - Instructional Leadership-Supervision Policy and Practice

Credits: 3 (NR)  
Introduces current topics and research in supervision and instruction, including theory and empirical work focused on instruction, teacher learning, teacher evaluation, and instructional leadership.

**Prerequisite(s):** Admission to Ph.D. in Education Program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

### EDLE 895 - Emerging Issues in Administration and Supervision

Credits: 3 (RD)  
Covers selected emerging issues in educational leadership. Students engage in research, study, discussion, and writing about various topics selected for study.

**Prerequisite(s):** Admission to PhD program, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### Education Research (EDRS)

Offered by the College of Education and Human Development

### EDRS 531 - Educational and Psychological Measurement

Credits: 3 (NR)  
Emphasizes techniques and principles used in the construction, administration, and quantification of measuring devices for evaluation purposes. Discusses interpretation of standardized tests of ability, aptitude, achievement, interest, and personality.

**Prerequisite(s):** Appropriate methods and advanced methods courses.

**Corequisite(s):** Appropriate methods and advanced methods courses.
EDRS 590 - Education Research

Credits: 3 (NR)
Develops skills, insights, and understanding to perform research, with emphasis on interpreting and applying research results. Critiques research, and uses findings in educational settings.

EDRS 597 - Special Topics in Education

Credits: 1-6 (RD)
Provides advanced study on selected topic or emerging issue in American or international education.

Prerequisite(s): Admission to program in GSE.

Notes: May be repeated for credit with CEHD approval.

EDRS 620 - Quantitative Inquiry in Education

Credits: 3 (NR)
Examines fundamental concepts and methods of statistics as applied to educational problems, including descriptive and inferential statistics.

Prerequisite(s): EDRS 590 or equivalent experience.

EDRS 621 - Qualitative Inquiry in Education

Credits: 3 (NR)
Focuses on basic application of naturalistic research methods. Examines major theoretical frameworks and qualitative research techniques, which include content analysis, coding, and interpretation of data.

Prerequisite(s): EDRS 590 or equivalent experience.
EDRS 630 - Educational Assessment

Credits: 3 (NR)
Examines research theory and practice relevant to assessments. Focuses on assessment strategies for students including developing skills to select, score, and interpret educational assessments.

EDRS 631 - Program Evaluation

Credits: 3 (NR)
Introduces perspectives of existing and emerging issues, theories, and models of program evaluation.

EDRS 797 - Advanced Topics in Education

Credits: 1-6 (RD)
Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.

Notes: May be repeated for credit with CEHD approval.

EDRS 810 - Problems and Methods in Education Research

Credits: 3 (NR)
Advanced course in interpreting and applying education research methods. Emphasizes comparison of alternative philosophies of research, ways of formulating questions and hypotheses, research plans, and analysis procedures. Students evaluate existing studies, and investigate a range of research approaches.

Prerequisite(s): Admission to PhD program, or permission of instructor.
EDRS 811 - Quantitative Methods in Educational Research

Credits: 3 (NR)
Emphasizes advanced methods of conducting research using quantitative methods of data collection, and analysis appropriate for research in education. Includes design of experimental and quasiexperimental research studies, and methods of analysis appropriate to these studies, including analyzing variance and multiple linear regression.

Prerequisite(s): Satisfactory completion of EDUC 810 or equivalent, or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDRS 812 - Qualitative Methods in Educational Research

Credits: 3 (NR)
Teaches how to apply qualitative data collection and analysis procedures in educational research, including ethnographic and other field-based methods, and unobtrusive measures.

Prerequisite(s): Satisfactory completion of EDUC 810 or equivalent, or permission of instructor. Prerequisite enforced by registration system.

Notes: Emphases vary depending on student interests and needs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDRS 820 - Evaluation Methods for Educational Programs and Curricula

Credits: 3 (NR)
Explores development and types of current systems and models for evaluating educational programs and curricula. Emphasizes evaluation needs and problems of public and private elementary and secondary schools, and colleges and universities. Also considers needs of government agencies, industry, and health-related organizations.

Prerequisite(s): Successful completion of EDRS 810, or permission of instructor.

Notes: Prior completion of EDRS 811 and 812 helpful but not required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDRS 821 - Advanced Applications of Quantitative Methods

Credits: 3 (NR)
Advanced study of applications of quantitative methods in educational research, reinforcing and building on concepts and skills acquired in EDRS 811. Uses modular approach, and provides advanced study of techniques appropriate to survey research,
group-experimental and quasiexperimental research, selected multivariate procedures and factor analysis, and quantitative synthesis (meta-analysis) of research. Combines text reading assignments, critques, and discussion of relevant journal articles; and application activities.

**Prerequisite(s):** EDRS 810 and 811.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDRS 822 - Advanced Applications of Qualitative Methods**

Credits: 3 (NR)  
Advanced seminar devoted to study of current topics in qualitative research. Deals with cutting-edge information on selected advanced topics in qualitative research, and provides opportunities to apply new skills and knowledge to projects related to students’ interests.

**Prerequisite(s):** EDRS 810 and 812.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDRS 823 - Advanced Research Methods in Single Subject/Case Design**

Credits: 3 (NR)  
Prepares students to conduct research using single subject design and single case study design. Provides understanding of salient features as well as advantages, disadvantages of these research methodologies. Students critique and analyze published research using these methodologies. Provides opportunities to apply these methodologies to research questions related to student interests.

**Prerequisite(s):** EDRS 810, 811, and 812.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDRS 824 - Mixed Methods Research: Integrating Qualitative and Quantitative Approaches**

Credits: 3 (NR)  
Advanced research seminar that integrates qualitative and quantitative approaches, methods, and data in a single study. The course covers the paradigms and "mental models” that inform both approaches, and the ways in which qualitative and quantitative goals, questions, methods, and interpretive strategies can be productively combined.

**Prerequisite(s):** EDRS 810, 811, and 812 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.
EDRS 825 - Advanced Research Methods in Self-Study

Credits: 3 (NR)  
Prepares students to conduct research using the self-study research methodology, a qualitative research approach for systematically examining one's practitioner role for improvement-aimed purposes with contributions to the educational field and knowledge base.

Prerequisite(s): Admission to PhD in Education program; EDRS 810; EDRS 811 or EDRS 812

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDRS 826 - Qualitative Case Study Methods

Credits: 3 (NR)  
Advanced research seminar on qualitative case study design and application in educational research. Topics include descriptive, theoretical, evaluation, and policy case study design and methods. Students will conduct and critique a case study appropriate to their discipline.

Prerequisite(s): EDRS 812 or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Summer

EDRS 827 - Development and Validation of Assessment Scales

Credits: 3 (NR)  
Focusing on the acquisition of knowledge and skills related to development of assessment scales and validation of assessment scale data in the context of education, psychology, and related fields.

Prerequisite(s): EDRS 811.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall

EDRS 828 - Modern Measurement in Education and Human Development

Credits: 3 (NR)  
Focuses on the acquisition of knowledge and skills related to modern theory of measurement with application in the context of education, psychology, and related fields.

Prerequisite(s): EDRS 811 or permission of instructor.
**EDRS 831 - Structural Equation Modeling**

Credits: 3 (NR)
Focusing on the development of knowledge and skills related to structural equation modeling and research applications in education, psychology, and related fields.

Prerequisite(s): EDRS 811.

**EDRS 890 - Research in Practice**

Credits: 3 (NR)
Interns work with appropriate staff member in cooperating school, school system, or other educational institution, agency, or setting.

**Educational Psychology (EDEP)**

Offered by the College of Education and Human Development

**EDEP 402 - Brain, Behavior, and Neuroimaging in Children**

Credits: 3 (NR)
Focus on research regarding the development of cognitive processes in children, their neurobiological substrates, and the imaging technology used to explore the functioning brain.

Prerequisite(s): At least junior standing or sophomore honors/university scholar candidate.

**EDEP 405 - The Neuroscience of Learning and Cognition**
Credits: 3 (NR)
Focuses on research regarding the development of cognitive processes in children and adults of various ages, their neurobiological substrates, and the imaging technology used to explore the functioning brain.

Equivalent to EDEP 655

Prerequisite(s): Junior standing or sophomore honors / university scholar candidate.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

EDEP 550 - Theories of Learning and Cognition

Credits: 3 (NR)
Explores theoretical perspectives on learning and cognition, and relation of these theories to construction of learning environments, student motivation, classroom management, assessment, and technology to support teaching and learning.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDEP 551 - Principles of Learner Motivation

Credits: 3 (NR)
Focuses on theories and concepts of human motivation; and examines strategies, techniques, and interventions that promote and sustain learner motivation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDEP 591 - Data-Driven Decision Making for Continuous Educational Improvement

Credits: 3 (NR)
Provides an intellectual and practical framework for creating and understanding formative and summative assessments of student performance. Emphasis is placed on the learning principles, cognitive processes, and psychometric models as they pertain to assessment issues.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer.

EDEP 592 - Data-Driven Decision-Making: Development of Assessments
Credits: 3 (NR)
Focuses on strategies to design assessments for students and schools with a particular emphasis on developing and using assessment methods to inform instructional decisions.

Prerequisite(s): EDEP 591—may be taken concurrently

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer.

**EDEP 593 - Data-Driven Decision Making: Analysis and Interpretation of Assessment Data**

Credits: 3 (NR)
Focusing on the development of knowledge and skills related to analyzing and interpreting educational assessment data.

Prerequisite(s): EDEP 592.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

**EDEP 594 - Data-Driven Decision-Making Application in Education Contexts**

Credits: 3 (NR)
Applies fundamental knowledge of assessment using team-based projects. Incorporates development of assessments and the analysis, interpretation, and reporting of assessment data to inform curriculum and instruction based on the context-specific needs of educators.

Prerequisite(s): EDEP 593.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Spring.

**EDEP 601 - Creativity and Cognition in the Arts and Media**

Credits: 3 (NR)
Focuses on research on cognition, development, learning, and creativity in the visual arts and media in formal and informal educational settings.

Equivalent to AVT 606

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDEP 632 - Human Development

Credits: 3 (NR)
Examines the course of human development from early childhood to adult, with special attention paid to childhood and adolescence. Major emphasis is placed on principles of research in human development and the major areas of cognitive, linguistic, and social contexts of development as they pertain to learners in schools and beyond.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

EDEP 650 - High-Stakes Assessment and Accountability Systems

Credits: 3 (NR)
Focuses on school effectiveness, assessment tools, and accountability models on state and national levels. Explores issues and methods relevant to educational policy, standardized testing, and classroom assessment.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDEP 651 - Modern Measurement with Applications in Education and the Behavioral Sciences

Credits: 3 (NR)
Provides background in modern measurement theory and applications. Covers topics from classical test theory, generalizability theory, and item response theory. Applications include advanced techniques in test construction, analysis of binary and rating data, test equating, item fairness, and cognitive diagnosis.

Prerequisite(s): EDRS 531

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDEP 652 - Process of Learning and Development

Credits: 3 (NR)
Explores different theoretical perspectives on learning and development. Focuses on historical and contemporary theories of learning and cognitive development, and examines current research and its application in educational settings.

Prerequisite(s): EDEP 550.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**EDEP 653 - Culture and Intelligence**

Credits: 3 (NR)
Explores different theoretical perspectives on intelligence as they relate to individual and cultural differences. Examines issues related to heritability and measures of intelligence, and intelligence in the cultural context.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDEP 654 - Learning, Motivation, and Self-Regulation**

Credits: 3 (NR)
Focuses on theories and research on self-regulation of academic learning. Presents multidimensional conceptual framework for studying and applying self-regulation in educational contexts.

Prerequisite(s): EDEP 550, 551.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDEP 655 - The Neuroscience of Learning and Cognition**

Credits: 3 (NR)
Focuses on research regarding the development of cognitive processes in children and adults of various ages, their neurobiological substrates, and the imaging technology used to explore the functioning brain.

Equivalent to EDEP 405

Prerequisite(s): EDEP 550

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**EDEP 798 - Directed Reading, Research, and Individual Projects in Educational Psychology**

Credits: 1-3 (RD)
Offers a capstone experience to students after completion of majority of program coursework with the exception of 6 credit hours. Enables students to demonstrate their integrative knowledge and skills accrued through study in their concentration area in educational psychology.

Prerequisite(s): Project mentor approval and completion of coursework in the MS in Educational Psychology exclusive of 6 credit hours.
EDEP 799 - Thesis in Educational Psychology

Credits: 1-3 (RD)
The thesis is based on original research. It enables students to demonstrate their integrative knowledge and skills accrued through study in their concentration area in educational psychology.

Prerequisite(s): Thesis chair approval and completion of coursework in the MS in Educational Psychology exclusive of 6 credit hours.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-12
Grading: Satisfactory/No credit only
When Offered: Fall, Spring, Summer

EDEP 820 - Teaching, Learning, and Cognition

Credits: 3 (NR)
Focuses on foundational educational psychology theories including cognitive, social, and constructivist themes and their implications for improving instructional practices and learning at all developmental levels and content areas.

Prerequisite(s): EDUC 800, 805; EDLE 802; and EDRS 810.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDEP 821 - Sociocultural Processes in Learning, Instruction, and Motivation

Credits: 3 (NR)
Examines processes by which social, cultural, and linguistic variables influence human behavior. Focuses on differences within and between cultural groups related to student's learning and achievement in educational settings.

Prerequisite(s): EDUC 800, 805; EDLE 802; and EDRS 810.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDEP 822 - Advanced Learning, Motivation, and Self-Regulation
Examines development of self-regulatory and motivational processes as they relate to educational practice. Emphasizes how processes influence students' self-motivation and achievement in various domains.

Prerequisite(s): EDUC 800, 805; EDLE 802; and EDRS 810.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDEP 823 - Research Project in Educational Psychology: Sequence I

Credits: 3 (NR)
Focuses on development and implementation of research studies in educational psychology. Students acquire skills regarding developing research questions and a sound methodological approach for their study.

Prerequisite(s): EDEP 820, 821, 822.

Notes: First in two-course sequence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDEP 824 - Research Project in Educational Psychology: Sequence II

Credits: 3 (NR)
Focuses on development and implementation of research studies in educational psychology. Students acquire skills regarding collecting, analyzing, and interpreting data.

Prerequisite(s): EDEP 823.

Notes: Second in two-course sequence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Electrical and Computer Engineering (ECE)

Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.

ECE 101 - Information Technology for Electrical Engineers
Introduces fundamental concepts in information technology that provide technical underpinning for state-of-the-art applications. Presents fundamental engineering skills and perspective on range of information technology through lectures and hands-on experiments. Discusses ethics, professionalism, historical development, and social implications of IT.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

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**ECE 201 - Introduction to Signal Analysis**

Credits: 3 (NR)  
Provides technically more rigorous introduction to problems and tools commonly encountered by electrical engineers. Introduces mathematical modeling of engineering problems and their solutions. Introduces standard software packages for electrical engineering as tools to simulate engineering problems on computer. Mathematical and computer models are related to physical reality provided by hands-on experiments.

**Prerequisite(s):** Grade of C or better in MATH 113. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 2  
**When Offered:** Fall, Spring

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**ECE 220 - Signals and Systems I**

Credits: 3 (NR)  
First of two-semester sequence of courses providing mathematical background for many ECE courses taken in junior and senior years. Introduces methods of representing continuous time signals and systems, and interaction between signals and systems. Covers analysis of signals and systems via differential equations and transform methods; Laplace and Fourier transforms as convenient analysis tools; frequency response of systems; and stability of systems in time and frequency domains. Presents application examples from communications, circuits, control, and signal processing.

**Prerequisite(s):** C or better in ECE 201 or equivalent. Prerequisite enforced by registration system.

**Corequisite(s):** MATH 203, 214

**Notes:** Students cannot receive credit for both ECE 220 and BENG 220.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 2  
**When Offered:** Fall, Spring, Summer

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**ECE 280 - Electric Circuit Analysis**

Credits: 5 (NR)  
Includes circuit analysis using superposition, equivalent circuits, and transient and steady-state analysis of RL, RC, and RLC circuits; applications of Laplace transform in circuit analysis; sinusoidal excitations and phasors; resonance; filters; AC steady-state analysis; coupled coils; and three-phase circuits. Includes lab demonstrating and investigating circuit analysis concepts.
Prerequisite(s): Grade of C or better in PHYS 260 and 261. Prerequisite enforced by registration system.

Corequisite(s): ECE 220 must be taken concurrently or before ECE 280.

Notes: Builds on simple circuit concepts introduced in PHYS 260.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

ECE 301 - Digital Electronics

Credits: 3 (NR)
Introduces digital systems, circuits, and computers. Topics include binary systems and codes, digital logic gates and circuits, microelectronics and integrated circuits, coding and multiplexing, multivibrators, shift registers, counters, A/D converters, and elementary computer architecture.

Prerequisite(s): Grade of C or better in MATH 125 or MATH 112.

Notes: Not intended for those majoring in electrical or computer engineering.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2
When Offered: Fall, Spring

ECE 303 - Digital Design/Intro Assembly Language

Credits: 4 (NR)
Introduces digital systems, circuits, and computers. Topics include binary systems and codes; digital logic gates and circuits; encoding and multiplexing; shift registers, counters, and elementary computer architecture/MIPS computer organization; and assembly language, including instruction format, data definition, load/store/arithmetic instructions, and addressing. Includes laboratory.

Prerequisite(s): CS 211 or IT 101, 108, and 212.

Notes: Not intended for electrical or computer engineering majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2
When Offered: Fall, Spring

ECE 305 - Electromagnetic Theory

Credits: 3 (NR)
Static and time varying electric and magnetic fields, dielectrics, magnetization, Maxwell's Equations, and introduction to transmission lines. Course uses vector calculus and algebra of complex numbers.
**Prerequisite(s):** Grade of C or better in PHYS 260 and MATH 214. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

### ECE 320 - Signals and Systems II

Credits: 3 (NR)  
Second of two-semester sequence providing mathematical background for many ECE courses taken in junior, senior years. Provides methods of representing and analyzing discrete-time signals and systems. Studies effects of converting from continuous-time to discrete time, and presents Z-transform as convenient analysis tool. Emphasizes powerful concept of frequency response of systems developed in first semester. Presents application examples from communications, circuits, control, and signal processing.

**Prerequisite(s):** Grade of C or better in ECE 220 and MATH 203. Prerequisite enforced by registration system.

**Notes:** Students cannot receive credit for both ECE 320 and BENG 320.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

### ECE 331 - Digital System Design

Credits: 3 (NR)  
Covers principles of digital logic and digital system design and implementation in VHDL. Topics include number systems; Boolean algebra; analysis, design, and minimization of combinational logic circuits; analysis and design of synchronous and asynchronous finite state machines; and introduction to VHDL and behavioral modeling of combinational and sequential circuits.

Prerequisite enforced by registration system.

**Corequisite(s):** ECE 280 and 332.

**Notes:** ECE 332 should be taken concurrently with ECE 331. Credit may not be received for ECE 301 and 331.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

### ECE 332 - Digital Electronics and Logic Design Lab

Credits: 1 (NR)  
Lab associated with ECE 331.

**Prerequisite(s):** PHYS 261 or 265, or permission of instructor Prerequisite enforced by registration system.
Corequisite(s): ECE 331.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

ECE 333 - Linear Electronics I

Credits: 3 (NR)
Principles of operation and application of electron devices and linear circuits. Topics include semiconductor properties, diodes, bipolar and field effect transistors, biasing, amplifiers, frequency response, operational amplifiers, and analog design.

Prerequisite(s): Grade of C or better in ECE 280 or ECE 286. Prerequisite enforced by registration system.

Notes: ECE 334 is usually taken concurrently with ECE 333.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECE 334 - Linear Electronics Lab I

Credits: 1 (NR)
Lab associated with ECE 333.

Prerequisite(s): PHYS 261 or 265, or permission of instructor

Corequisite(s): ECE 333.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

ECE 410 - Principles of Discrete-Time Signal Processing

Credits: 3 (NR)
Introduces fundamental concepts of digital signal processing. Emphasis on the theoretical and numerical tools used for frequency domain analysis of sampled signals. Topics covered include sampling, the discrete Fourier transform, fast transform algorithms, spectral analysis, and digital filtering.

Prerequisite(s): ECE 320 with grade of C or better.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECE 421 - Classical Systems and Control Theory

Credits: 3 (NR)
Introduces analysis and synthesis of feedback systems, including functional description of linear and nonlinear systems, block diagrams and signal flow graphs; state-space representation of dynamical systems, frequency response methods, Root Locus, Nyquist, and other stability criteria; performance indices and error criteria; and applications to mechanical and electromechanical control systems.

Equivalent to SYST 421

Prerequisite(s): Grade of C or better in ECE 220. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECE 422 - Digital Control Systems

Credits: 3 (NR)
Introduces analysis, design of digital control systems, Z-transform, discrete linear systems, frequency domain, and state variable techniques. Discusses use of microcomputers in control systems.

Prerequisite(s): Grade of C or better in ECE 320 and 421.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

ECE 429 - Control Systems Lab

Credits: 1 (NR)
Laboratory experiments for topics in control systems analysis, design, and implementation with emphasis on using microcomputers.

Prerequisite(s): Grade of C or better in ECE 421.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
When Offered: Spring

ECE 430 - Principles of Semiconductor Devices

Credits: 3 (NR)
Introduces solid-state physics and its application to semiconductors and semiconductor devices. Topics include band theory, doping, p-n junctions, diffusion theory, low-frequency circuits, devices including bipolar transistor, MOSFET, CMOS, and photo transistors.
Prerequisite(s): Grade of C or better in ECE 333, ECE 305 and MATH 214.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

ECE 431 - Digital Circuit Design

Credits: 3 (NR)
Analysis and design of discrete and integrated switching circuits. Topics include transient characteristics of diodes, bipolar, and field-effect transistors; MOS and bipolar inverters; nonregenerative and regenerative circuits; TTL, ECL, IIL, NMOS, and CMOS technologies; semiconductor memories; VLSI design principles; and SPICE circuit analysis.

Prerequisite(s): Grade of C or better in ECE 331 and 333.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ECE 433 - Linear Electronics II

Credits: 3 (NR)
Second course in linear electronics. Covers differential amplifiers, feedback circuits, power amplifiers, feedback amplifier frequency response, analog integrated circuits, operational amplifier systems, oscillators, wide band and microwave amplifiers, and computer-aided design.

Prerequisite(s): Grade of C or better in ECE 333. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

ECE 434 - Linear Electronics II Laboratory

Credits: 1 (NR)
Second lab course in linear electronics involving analysis and design of topics listed in ECE 433.

Prerequisite(s): ECE 334 Prerequisite enforced by registration system.

Corequisite(s): ECE 433.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring
ECE 435 - Digital Circuit Design Laboratory

Credits: 1 (NR)
Lab experiments for topics covered in ECE 431.

Prerequisite(s): ECE 334
Corequisite(s): ECE 431.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

ECE 437 - Principles of Microelectronic Device Fabrication

Credits: 3 (NR)
Introduces fundamentals of microelectronic semiconductor device fabrication technology. Processing steps include photolithography, oxidation, diffusion, ion implantation, chemical vapor deposition, ohmic contact metalization, interconnects, packaging, MOS process integration, and bipolar process integration. Laboratory project integral to course.

Prerequisite(s): Grade of C or better in ECE 333 or 430.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 3

ECE 445 - Computer Organization

Credits: 3 (NR)
General overview of operating a digital computer. Topics include computer arithmetic, arithmetic unit, hardwired and microprogrammed control, memory, register-to-register, input-output operations, and behavioral modeling of computer organization using VHDL.

Prerequisite(s): Grade of C or better in ECE 331 and ECE 332 and in either CS 262 or CS 222. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECE 446 - Device Driver Development

Credits: 3 (NR)
Addresses device driver and kernel level software programming and development. The C programming language and program trouble shooting are reviewed. Basics of device driver software, Character driver operations and data structures, concurrency and race conditions, kernel timers, memory allocation, communications with hardware, interrupt handling, kernel data types, memory mapping and Direct Memory Access concepts are explored.
Prerequisite(s): C or better in ECE 445. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ECE 447 - Single-Chip Microcomputers

Credits: 4 (NR)
Explores designing with single-chip microcomputers and microcomputer interfacing. Topics include role of microcomputers compared with microprocessors and other computers, microcomputer architecture and organization, real-time control issues, assembly language programming for control, design of control software, input/output methods, design tools, and available single-chip microcomputers. Students select project and design, and construct system including single-chip microcomputer and ancillary hardware to implement control system.

Fulfills general education requirement in synthesis.

Prerequisite(s): Grade of C or better in ECE 445 and in either CS 367 or CS 222.

Notes: This course is highly recommended for ECE 492/493 students interested in using microcontroller technology in their senior design projects. It should be taken before ECE 493.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall

ECE 448 - FPGA and ASIC Design with VHDL

Credits: 4 (NR)
Practical introduction to modeling of digital systems with VHDL for logic synthesis. Overview and comparative analysis of design flow and tools for FPGAs and standard-cell ASICs. Discusses verification of digital systems using testbenches, prototyping boards and modern testing equipment, and illustrates VHDL-based design methodology with multiple examples from communications, control, DSP, and cryptography. Laboratory experiments create link between simulation and actual hardware implementation based on FPGA boards.

Prerequisite(s): Grade of C or better in ECE 445. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Spring

ECE 450 - Introduction to Robotics

Credits: 3 (NR)
Introduces mobile robotic systems. Topics include overview of power systems, motors, behavior-based programming, sensors, and sensor integration. Design projects conceived, developed, implemented, and presented.
Prerequisite(s): CS 112, ECE 280, ECE 331 and either ECE 332 or ECE 301, all with grade of C or better.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 460 - Communication and Information Theory

Credits: 3 (NR)
Introduction to analog and digital communications. Topics include review of important concepts from signals and systems theory and probability theory, Gaussian processes and power spectral density; digital transmission through additive white Gaussian channels; sampling and pulse code modulation; analog signal transmission and reception using amplitude, frequency and phase modulation; and affects of noise on analog communication systems.

Prerequisite(s): Grade of C or better in ECE 220 and STAT 346. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 461 - Communication Engineering Laboratory

Credits: 1 (NR)
Lab experiments in analog and digital communication areas covered in ECE 460.

Prerequisite(s): ECE 460 and 334. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

ECE 462 - Data and Computer Communications

Credits: 3 (NR)
Introduces modern data communications and computer networks. Topics include point-to-point communication links and transmission of digital information, modems, and codecs; packet switching, multiplexing, and concentrator design; multiaccess and broadcasting; local area and wide area networks; architectures and protocols for computer networks; OSI reference model and seven layers; physical interfaces and protocols; and data link control layer and network layer. Provides examples of data networks.

Prerequisite(s): STAT 344 or 346, and ECE 220, and ECE 331 or 303, all with grade of C or better.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
ECE 463 - Digital Communications Systems

Credits: 3 (NR)
Introduces digital transmission systems. Topics include quantization, digital coding of analog waveforms, PCM, DPCM, DM, baseband transmission, digital modulation schemes, ASK, FSK, PSK, MSK, QAM, pulse shaping, intersymbol interference, partial response, voice-band and wideband modems, digital cable systems, regenerative repeaters, clock recovery and jitter, multipath fading, digital radio design, optimal receiver design, MAP receiver, and probability of error.

Prerequisite(s): ECE 460.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 464 - Modern Filter Design

Credits: 3 (NR)
Offers solution to filtering approximation problem via Butterworth, Chebyshev, Elliptic, and Bessel approaches. Covers transfer function scaling and type transformations, review of Z-transform, time and frequency domain effects of A/D and D/A conversion, and digital filter design and implementation.

Prerequisite(s): ECE 320 with a grade of C or better.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

ECE 465 - Computer Networking Protocols

Credits: 3 (NR)
Introduces computer networking protocols and concepts, emphasizing Internet and Internet Protocol Suite. Covers computer networking protocols at application, transport, and network layers, including multimedia networking protocols, and network security and management.

Prerequisite(s): STAT 346, and CS 112, both with a grade of C or better.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

ECE 467 - Network Implementation Laboratory

Credits: 1 (NR)
Hands-on experience in implementing, configuring, and operating local and wide area networks in live laboratory environment equipped with modern local and wide area network devices and technologies. Students exposed to real-world computer networking scenarios including local area network implementation, asynchronous communication setup, and wide area network implementation using various protocols and technologies covering all layers of computer network protocol stack.
**Prerequisite(s):** ECE 462. Prerequisite enforced by registration system.

**Corequisite(s):** ECE 465.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 3

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**ECE 469 - Microwave Circuit Laboratory**

Credits: 1 (NR)  
Introduces microwave engineering laboratory techniques and measurements, and the design, fabrication, and test of microwave microstrip circuits.

**Prerequisite(s):** ECE 305 and 334.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 2

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**ECE 491 - Engineering Seminar**

Credits: 1 (NR)  
Engineering ethics, professionalism, role of engineer in society, current topics, and employment opportunities.

Equivalent to BENG 491

**Prerequisite(s):** 90 credits applicable to electrical engineering or computer engineering program, and COMM 100.

**Notes:** Students cannot receive credit for both ECE 491 and BENG 491.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**ECE 492 - Senior Advanced Design Project I**

Credits: 1 (NR)

Conception of senior design project and determination of feasibility of proposed project. Work includes developing preliminary design and implementation plan. Students planning to use microcontroller technology in their projects should enroll in ECE 447 before taking ECE 493.

Fulfills general education requirement in synthesis.

**Prerequisite(s):** Senior status in electrical engineering or computer engineering program, and COMM 100 and ENGH 302.
ECE 493 - Senior Advanced Design Project II

Credits: 2 (NR)

Implementation of project for which preliminary work was done in ECE 492. Project includes designing and constructing hardware, writing required software, conducting experiments or studies, and testing complete system. Requires oral and written reports during project and at completion.

Fulfills general education requirement in synthesis.

Prerequisite(s): ECE 492, preferably in preceding semester.

Notes: Students planning to use microcontroller technology in their projects should enroll in ECE 447 before taking ECE 493. Completing this course with a C or better satisfies university's general education synthesis requirement.

ECE 498 - Independent Study in Electrical and Computer Engineering

Credits: 1-3 (RT)

Directed self-study of special topics of current interest in ECE. Topic must be arranged with an instructor and approved by department chair before registering.

Notes: Maximum 3 credits.

ECE 499 - Special Topics in Electrical Engineering

Credits: 0-4 (RT)

Topics of special interest to undergraduates.

Prerequisite(s): Permission of instructor; specific prerequisites vary with nature of topic.

Notes: May be repeated for maximum of 6 credits if topics substantially different.
ECE 507 - Seminar in Emerging Technologies

Credits: 3 (NR)
Study of emerging technologies, how they are identified, how they evolve, actions which may encourage or stifle their growth, government influences, societal influences, examples of success and failure, and some lessons to be learned which are unique to government information technology. Topics covered will include a general introduction to emerging technologies, with emphasis on IT, discussion of difficulty in letting go of legacy systems, the DOD Global Information Grid, Cyberwarfare, Complex Adaptive Systems, and Federal Government support of Research and Development. Cannot be used in the PhD IT program.

Prerequisite(s): Graduate Standing.

ECE 510 - Real-Time Concepts

Credits: 3 (NR)
Presents design methodology, principles and practice for the development of real-time embedded systems and their application to robotics, mechatronics, sensing, signal processing, and control. Topics include system decomposition, multi-tasking, task communication and synchronization, system modeling, time analysis, principles of filter and controller implementation, 'fuzzy' engineering, and multi-microcontroller systems.

Prerequisite(s): ECE 450 or ECE 447 or permission of instructor.

ECE 511 - Microprocessors

Credits: 3 (NR)
Introduces microprocessor software and hardware architecture. Includes fundamentals of microprocessor system integration, instruction set design, programming memory interfacing, input/output, direct memory access, interrupt interfacing, and microprocessor architecture evolution. Studies Intel family of microprocessors, and reviews other microprocessor families and design trends.

Prerequisite(s): ECE 445 or equivalent.
ECE 520 - Applications of Analog and Digital Integrated Circuits

Credits: 3 (NR)
Studies analog and digital integrated circuits mainly from communications applications point of view. Covers analog, digital, and mixed (analog/digital) building block circuits used in system design including operational amplifiers, comparators, voltage regulators, video amplifiers, oscillators, modulators, phased locked loops, multiplexers, active filters, A/D and D/A converters, and optoelectronic circuits.

Prerequisite(s): ECE 433 and 431, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 521 - Modern Systems Theory

Credits: 3 (NR)
Introduces linear systems theory and design of linear feedback control systems. Reviews linear algebra, state variables, state-space description of dynamic systems, analysis of continuous-time and discrete-time linear systems, controllability and observability of linear systems, and stability theory.

Prerequisite(s): ECE 521.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 524 - Process Control Fundamentals

Credits: 3 (NR)
Provides fundamentals of process control methodologies that are applicable in manufacturing industries, such as semiconductor manufacturing. Introduces the basic concepts of controlled processes equipped with digital control loops, starting with basic discrete-time models, deterministic and random signals and parameter estimation. Provides exposition of fundamentals and applications of feedback control principles, self-tuning control, run-to-run control and system diagnostics.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 525 - Hardware/Software Integration

Credits: 3 (NR)
Provides fundamentals of modern computer system and hardware/software integration through the use of quantitative approaches, cost-performance-power tradeoffs, and engineering designs. Introduces design considerations where hardware and software interlock with each other. Course topics include quantitative computer design, exploitation of hardware and software parallelism at instruction-, multiprocessor-, and thread-level, memory hierarchy, storage system, interconnection network, and embedded system design.
Prerequisite(s): Graduate standing

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECE 528 - Introduction to Random Processes in Electrical and Computer Engineering**

Credits: 3 (NR)
Probability and random processes are fundamental to communications, control, signal processing, and computer networks. Provides basic theory and important applications. Topics include probability concepts and axioms; stationarity and ergodicity; random variables and their functions; vectors; expectation and variance; conditional expectation; moment-generating and characteristic functions; random processes such as white noise and Gaussian; autocorrelation and power spectral density; linear filtering of random processes, and basic ideas of estimation and detection.

Prerequisite(s): ECE 220 and STAT 346, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECE 530 - Sensor Engineering**

Credits: 3 (NR)
Presents the fundamentals of sensor characteristics and transfer functions, sensor circuits and interfacing, sensor noise, and protection methods. Studies of different methods used in sensing position, motion, acceleration, force, humidity, temperature, chemicals, etc. are developed, followed by an analysis of specific sensor designs.

Prerequisite(s): Graduate Standing, or permission from instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

**ECE 531 - Introduction to Wireless Communications and Networks**

Credits: 3 (NR)
Presents the basics of modern wireless communications and wireless networking at the first-year graduate level. Topics include wireless signal design, channel characterization, receiver structure, multiple access technologies, cellular concepts, capacity enlargement, mobility management, and wireless/wireless interworking.

Prerequisite(s): ECE 460 or equivalent

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
ECE 535 - Digital Signal Processing

Credits: 3 (NR)
Representation analysis and design of digital signals and systems. Covers sampling and quantization, z-transform and discrete Fourier transform, digital filter realizations, design techniques for recursive and non-recursive filters, fast Fourier transform algorithms, and spectral analysis. Additional topics may include adaptive filtering, homomorphic digital signal processing, digital interpolation and decimation.

Prerequisite(s): ECE 320 and STAT 346.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ECE 537 - Introduction to Digital Image Processing (DIP)

Credits: 3 (NR)
First course in digital-image processing; introduces scanning systems, focal plane array detectors, data acquisition methods, display hardware, image preprocessing algorithms, feature extraction, and basic image processing methods. Semester-long image processing project includes utilizing modern image processing system prototyping software.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 538 - Medical Imaging

Credits: 3 (NR)
Provides an introduction to the physical, mathematical and engineering foundations of modern medical imaging systems, medical image processing and analysis methods. In addition, this course introduces engineering students to clinical applications of medical imaging. The emphasis is on diagnostic ultrasound and magnetic resonance imaging methods, although several other modalities are covered. The course also provides an overview of recent developments and future trends in the field of medical imaging, discusses some of the challenges and controversies, and involves hands-on experience applying the methods learned in class to real-world problems.

Equivalent to BENG 538

Prerequisite(s): Graduate Standing or permission of instructor; ECE 320 or equivalent; PHYS 262 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ECE 540 - Modern Telecommunications
Credits: 3 (NR)
Comprehensive overview of telecommunications including current status and future directions. Topics include review of evolution of telecommunications; voice and data services; basics of signals and noise, digital transmission, network architecture, and protocols; local area, metropolitan, and wide area networks and narrowband ISDN; asynchronous transfer mode and broadband ISDN; and satellite systems, optical communications, cellular radio, personal communication systems, and multimedia services. Uses examples of real-life networks to illustrate concepts and gain insight.

Equivalent to TCOM 500

Prerequisite(s): Graduate standing

Notes: For students outside of the program. Cannot be applied toward degrees in electrical or computer engineering.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 541 - Computer Architectures - A Survey

Credits: 3 (NR)
Survey of computer architectures. Covers basic concepts, definitions, single and multiple processor machines, multicore processors, parallel processing, pipelining, instruction level parallelism (ILP), simultaneous multithreading (SMT), and current trends in computer architectures. Course designed for MS AIT students. Cannot be used for credit in MSCpE or MSEE.

Prerequisite(s): IT 212 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 542 - Computer Network Architectures and Protocols

Credits: 3 (NR)
Introduction to architectures and protocols of computer networks and concept of packet switching. Topics include ISO standard layer model, physical interfaces and protocols, data link control, multiaccess techniques, packet switching, routing and flow control, network topology, data communication subsystems, error control coding, local area network, satellite packet broadcasting, packet radio, interconnection of packet-switching networks, network security and privacy, and various examples of computer networks.

Prerequisite(s): STAT 344 or equivalent, and graduate standing in VSITE.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

ECE 545 - Digital System Design with VHDL

Credits: 3 (NR)
Introduction to the design of complex digital systems using hardware description languages. Emphasizes the design methodology
based on the partitioning of a digital system into a datapath and control unit. Introduces a clear sequence of steps leading from specification to synthesizable, register transfer level (RTL), and fully verified HDL code. Covers VHDL for digital circuit design, including dataflow, structural, and behavioral coding styles. Introduces and illustrates the concepts of VHDL simulation, verification, synthesis, mapping, placing, routing, timing analysis and performance optimization. Requires semester long project devoted to the design of a complex digital system using VHDL as a hardware description language and FPGA as an implementation platform.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ECE 548 - Sequential Machine Theory**

Credits: 3 (NR)  
Theoretical study of sequential machines. Topics include sets, relations and lattices, switching algebra, functional decomposition, iterative networks, representation, minimization and transformation of sequential machines, state identification, state recognizers, and linear and stochastic sequential machines.

**Prerequisite(s):** ECE 331, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**ECE 549 - Theory and Applications of Artificial Neural Networks**

Credits: 3 (NR)  

**Prerequisite(s):** ECE 320 or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ECE 563 - Introduction to Microwave Engineering**

Credits: 3 (NR)  
Studies propagation, storage of microwave signals. Examines transmission lines, waveguides, resonators, scattering parameters, Smith charts, measurement techniques, instrumentation, and microwave striplines and microstrips.

**Prerequisite(s):** ECE 305, or permission of instructor.
ECE 565 - Introduction to Optical Electronics

Credits: 3 (NR)
Introduces optoelectronic devices for generation, detection, and modulation of light. Topics include electro-optic modulators, gas, solid state and semiconductor lasers, photodetectors, and detector arrays.

Prerequisite(s): ECE 305 and 333.

ECE 567 - Optical Fiber Communications

Credits: 3 (NR)
Studies components and integration of fiber-optic transmission systems. Topics include optical fibers, signal degradation, optical sources, power launching and coupling, photodetectors, receiver circuits, link analysis, and optical measurements.

Prerequisite(s): ECE 565 or permission of instructor.

ECE 568 - Introduction to Imaging Sensors

Credits: 3 (NR)
Imaging sensors are being used extensively in defense, homeland security, biomedical, scientific and consumer applications. This course provides introduction to the operating principles of the front-end optics and sensor technologies. In addition to the familiar cameras, the course will also discuss advanced microscopy, 3D medical imaging (tomography, MRI) and radar-imaging systems.

Prerequisite(s): Graduate status or permission of instructor.

ECE 584 - Semiconductor Device Fundamentals

Credits: 3 (NR)
Studies principals of operation of semiconductor devices based on solid state physics. Topics include band theory of solids, intrinsic and extrinsic semiconductor properties, pn junction diode, bipolar junction transistor, Schottky diode, metal insulator semiconductor junctions, field-effect transistors, and hetero-structures.
**Prerequisite(s):** ECE 430 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**ECE 586 - Digital Integrated Circuits**

Credits: 3 (NR)  
Studies design and analysis of digital integrated circuits, emphasizing CMOS technology. Reviews MOSFET operation and SPICE modeling. Covers analysis and design of basic inverter circuits, structure and operation of combinational and sequential logic gates, dynamic logic circuits, chip I/O circuits, and brief introduction to VLSI methodologies.

**Prerequisite(s):** ECE 331 and 430, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**ECE 587 - Design of Analog Integrated Circuits**

Credits: 3 (NR)  
Studies design methodologies of CMOS-based analog integrated circuits. Topics include differential amplifiers, current sources, output stages, operational amplifiers, comparators, frequency response, noise, and computer-aided design.

**Prerequisite(s):** ECE 333 and 430, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**ECE 590 - Selected Topics in Engineering**

Credits: 3 (RT)  
Selected topics from recent developments, and applications in various engineering disciplines. Designed to help professional engineering community keep abreast of current developments.

**Prerequisite(s):** Graduate standing or permission of department.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ECE 611 - Advanced Microprocessors**
Credits: 3 (NR)
Covers principles of advanced 32-bit and 64-bit microprocessors. Includes microprocessor structure and architecture, pipeline hazards, instruction-level parallelism, superscalar and superpipelined execution, thread-level parallelism; and RISC principles and advantages. Offers examples of RISC-type microprocessors. Studies in detail Intel IA-32, Intel and HP IA-64, and Motorola M68000 families.

Prerequisite(s): ECE 511 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 612 - Real-Time Embedded Systems

Credits: 3 (NR)
Study of real-time operating systems and device drivers for embedded computers. Emphasizes microprocessor systems and associated input device sampling strategies, including interrupt driven and polled I/O. Covers basic input/output operations, analog to digital conversion methods, I/O programming techniques and process, and communication control methodologies. Involves design project.

Prerequisite(s): ECE 511 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 620 - Optimal Control Theory

Credits: 3 (NR)
Detailed treatment of optimal control theory and its applications. Topics include system dynamics and performance criteria, calculus of variations and Pontryagin's minimum principle, computational methods in optimal control, and applications of optimal control.

Prerequisite(s): ECE 521 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 621 - Systems Identification

Credits: 3 (NR)

Prerequisite(s): ECE 521 and 528, or permission of instructor.
ECE 624 - Control Systems

Credits: 3 (NR)
Analysis, design, and implementation of digital feedback control systems. Topics include discrete-time models, pole-placement, controller design methods, MIMO system decoupling, and observer design.

Prerequisite(s): ECE 421 and 521, or permission of instructor.

Notes: Course may include simulation and design project.

ECE 630 - Statistical Communication Theory

Credits: 3 (NR)
Introduces optimum receiver design in the additive white Gaussian noise environment. Topics include efficient signal set design, modulation techniques, matched filter, correlation detector, coherent and noncoherent detections, fading and diversity channels, random amplitude and phase, diversity techniques, performance bounds of communications, and waveform communications.

Prerequisite(s): ECE 528.

ECE 633 - Coding Theory

Credits: 3 (NR)
Mathematics of coding groups, rings, and fields, and polynomial algebra. Topics include linear block codes, generator and parity check matrices; error syndromes, binary cyclic and convolutional codes; and implementation of encoders and decoders.

Prerequisite(s): ECE 528 or permission of instructor

ECE 635 - Adaptive Signal Processing

Credits: 3 (NR)
Introduces adaptive systems and adaptive signal processing. Topics include correlation functions and matrices; performance functions; search of minimum; steepest descent and Newton algorithms; least mean squares algorithm; noise perturbed search and
misadjustment; sequential regression algorithm and convergence issues; recursive least squares algorithm and forgetting factor; frequency domain algorithms; adaptive equalization; pseudorandom binary sequences and system identification; adaptive interference cancellation; and adaptive beam forming and arrays. Simulates adaptive algorithms.

Prerequisite(s): ECE 528.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 638 - Fast Algorithms and Architectures for Digital Signal Processing

Credits: 3 (NR)
Studies recent advances in development of signal processing algorithms and relevant computational architectures. Topics include fast polynomial transforms, Winograd's algorithms, multirate processing of digital signals, spectral estimation, adaptive filtering, and wavelet transforms.

Equivalent to IT 838

Prerequisite(s): ECE 535 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 641 - Computer System Architecture

Credits: 3 (NR)
Advanced course in computer architecture. Covers definitions, multiple processors, VLSI architecture, data flow, computation, semantic gap, high-level language architecture, object-oriented design, RISC architecture, and current trends in computer architecture.

Prerequisite(s): ECE 511 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 642 - Design and Analysis of Computer Communication Networks

Credits: 3 (NR)
Introduces queuing theory. Other topics include concentrator design, multiplexing, capacity assignments, random access schemes, polling and probing techniques, topology design, flow control and routing, packet radio, protocol specification, and validation.

Prerequisite(s): ECE 542 and 528, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECE 643 - Network Switching and Routing

Credits: 3 (NR)
Fundamentals of switching and routing with application to communications networks, both wireline and wireless. Topics include concepts of space and time for switching and forwarding of data, scalability and performance, label swapping, algorithms for routing and path computation, constrained route optimization, traffic theory, control and signaling, and traffic engineering. The course also covers the concepts and issues underlying the design and implementation of the contemporary switched networks.

Prerequisite(s): ECE 528 and 542

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 644 - Architectures and Algorithms for Image Processing

Credits: 3 (NR)
Architectures and algorithms to analyze and process pictorial information. Topics include systems and techniques for digital representation of images; image scanning methods and their applications; picture processing languages; image data structures; feature detection, extraction, and reconstruction; detection of symmetries; systems and methods for regular decomposition; image desegmentation; object thinning; real-time orthogonal transformations; and applications. Includes design project.

Prerequisite(s): ECE 511 and 537, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 645 - Computer Arithmetic

Credits: 3 (NR)
Covers computer arithmetic as applied to the design of general-purpose microprocessors and application-specific integrated circuits for cryptography, coding, and digital signal processing. Focuses on efficient implementations of all basic arithmetic operations in three major domains: integers, real numbers, and elements of Galois Fields GF(2^n). Illustrates tradeoffs among various hardware algorithms and architectures depending on primary optimization criteria, such as speed, area, and power consumption. Demonstrates the use of software implementations as a source of test vectors for verification of hardware implementations and for evaluating hardware versus software speed-up.

Prerequisite(s): ECE 545 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 646 - Cryptography and Computer Network Security
Credits: 3 (NR)
Topics include need for security services in computer networks, basic concepts of cryptology, historical ciphers, modern symmetric ciphers, public key cryptography (RSA, elliptic curve cryptosystems), efficient hardware and software implementations of cryptographic primitives, requirements for implementation of cryptographic modules, data integrity and authentication, digital signature schemes, key exchange and key management, standard protocols for secure mail, the web and electronic payments, security aspects of mobile communications, key escrow schemes, zero-knowledge identification schemes, smart cards, quantum cryptography, and quantum computing.

Prerequisite(s): ECE 542 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 650 - Robotics

Credits: 3 (NR)
Introduces robotics and advanced automation from electrical engineering standpoint. Topics include hardware overview; coordinate systems and manipulator kinematics; differential motion and inverse Jacobian; manipulator path control and motion planning; design and control of articulated hands; sensory feedback; machine vision; and applications to industrial automation.

Prerequisite(s): ECE 521 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 652 - Mobile Robots

Credits: 3 (NR)
Treats kinematic modeling of mobile robots with wheels, steering control, navigation and remote sensing. GPS as well as inertial navigation discussed. Kalman filtering applied to state estimation of robot position and attitude and also applied to estimation of the location of detected objects. Target tracking is developed for repeated observations of a detected object as well as simultaneous tracking of multiple objects.

Prerequisite(s): ECE 521 and ECE 528 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

ECE 665 - Fourier Optics and Holography

Credits: 3 (NR)
Studies optical systems for processing temporal signals as well as images. Topics include use of coherent optical systems for image processing and pattern recognition, principles of holography, and acousto-optic systems for radar-signal-processing optical computers.

Prerequisite(s): ECE 565.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECE 670 - Principles of C4I**

Credits: 3 (NR)
Provides broad introduction to fundamental principles of command, control, communication, computing, and intelligence (C4I). Applies principles, techniques to wide range of civilian and military situations. Discusses modeling, simulation of combat operations; studies sensing, fusion, and situation assessment processes. Derives optimal decision-making rules. Discusses concepts of C4I architectures and tools to evaluate and design systems such as queuing theory.

Prerequisite(s): ECE 528 or SYST 611 or OR 542, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECE 672 - Introduction to Architecture-Based Systems Engineering**

Credits: 3 (NR)
Explores life cycles in systems engineering and human, organizational, process, and technological basis for systems integration and architecting. Includes societal and cultural basis; conceptual frameworks; structure, function, and purpose; risk management; user requirements and functional specifications; bid and proposal process; System of Systems issues; systems management; increasing returns to scale, network effects, and path dependency issues; and evolutionary systems.

Equivalent to SYST 619

Prerequisite(s): SYST 510 or SYST 520 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECE 673 - Discrete Event Systems**

Credits: 3 (NR)
Introduces modeling and analysis of discrete event dynamical systems. Covers elements of discrete mathematics, and focuses on Petri Net Models and their basic properties: locality and concurrency, condition and event systems, place and transition nets, Colored Petri Nets, reachability graphs (occurrence nets), and invariant analysis. Includes issues in Petri Nets and temporal logic; stochastic Petri Nets; relation to other discrete event models of dynamical systems; and applications of the theory to modeling and simulation and systems engineering problems, especially in systems architecting.

Equivalent to SYST 620

Prerequisite(s): ECE 521, or SYST 611 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECE 674 - Systems Architecture Design

Credits: 3 (NR)
Intensive study of relationships of different types of architecture representations and methodologies to obtain them. Uses approaches based on systems engineering constructs, such as structured analysis and software engineering constructs, including object orientation, to develop architecture representations and derive executable model of information architecture. Executable model is then used for behavior analysis and performance evaluation. Discusses roles of systems architect and engineer. Uses examples from current practice including C4ISR architectures.

Equivalent to SYST 621

Prerequisite(s): SYST 619/ECE 672 and SYST 620/ECE 673 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 675 - System Integration and Architecture Evaluation

Credits: 3 (NR)
Explores human, organizational, societal, cultural, and technological aspects of system integration problem. Includes role of architectures in systems integration, and integration in System of Systems and Federation of Systems. Evaluates architectures; measures performance and effectiveness; analyzes alternative architecture and integration strategies; and assesses system capabilities.

Equivalent to SYST 622

Prerequisite(s): SYST 620 or ECE 673 and SYST 621 or ECE 674 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 678 - Systems Engineering of Information Architectures

Credits: 3 (NR)
An intensive study of the relationships between different types of architecture representations and the methodologies used to obtain them. Approaches based on systems and software engineering constructs, such as object orientation and structured analysis are used to develop architecture representations or views. The roles of the systems architect and the systems engineer are discussed. The function of an executable model of the information architecture in deriving requirements is presented. Examples from current practice including C4ISR architectures are included.

Equivalent to SYST 631

Prerequisite(s): SYST 520 and SYST 619 or ECE 672.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECE 680 - Physical VLSI Design

Credits: 3 (NR)
Introduces NMOS, CMOS, and BiMOS integrated circuit technology and fabrication. Reviews MOS and BiCMOS inverter structures and operation, MOS and BiCMOS circuit design processes, MOS layers, stick diagrams, design rules, and layout. Covers subsystem design and layout illustration of design process through design of 4bit arithmetic processor and its parts, adder, multiplier, register, and memory cells; and aspects of system timing, test and testability. Reviews currently available VLSI CAS tools.

Prerequisite(s): ECE 586 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 681 - VLSI Design for ASICs

Credits: 3 (NR)
Introduces VLSI design of application-specific integrated circuits (ASICs) from front-end to back-end using HDL and modern design automation software. Covers simulation, synthesis of digital circuits using standard cells, static timing analysis, formal verification, power analysis, test generation/fault simulation, and physical design including floor planning, placement, routing, and design rule checking. Addresses deep submicron CMOS scaling issues and other advanced topics.

Prerequisite(s): ECE 545, or permission of instructor.

Corequisite(s): ECE 586

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 682 - VLSI Test Concepts

Credits: 3 (NR)
Broad introduction to basic concepts, techniques, and tools of modern VLSI testing. Fundamentals of defect modeling, fault simulation, design for testability, built-in self-test techniques, and failure analysis. Test economics, physical defects and fault modeling, automated test pattern generation, fault simulation, design for test, built-in self test, memory test, PLD test, mixed-signal test, Idq test, boundary scan and related standards, test synthesis, diagnosis and failure analysis, automated test equipment, embedded core test.

Prerequisite(s): ECE 586

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 684 - MOS Device Electronics
Credits: 3 (NR)
Study of Metal Oxide Semiconductor (MOS)-based device theory, characteristics, models, and limitations. Topics include MOS capacitor, MOSFETs, CMOS, charge coupled devices, scaling, hot carrier effects, latchup, radiation effects, and isolation techniques.

Prerequisite(s): ECE 584 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 685 - Nanoelectronics

Credits: 3 (NR)
Emphasizes the fundamental concepts and principles that govern the operation of nano-electronic devices (100 nm down to 1 nm.). Addresses basic device building blocks such as quantum dot (QD), single electron tunneling transistor (SETT), carbon nanotube (CNT), nanowire, etc. Considers the design and analysis of a variety of nano-devices ("quantum" or "mesoscopic" devices) and examine some notable applications.

Prerequisite(s): ECE 584

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ECE 689 - VLSI Processing

Credits: 3 (NR)
In-depth study of various steps in silicon VLSI circuit processing. Includes thermal oxidation, diffusion, ion implantation, epitaxial growth, polysilicon, metal and insulator layer deposition, photolithography, and MOS processing integration. Involves hands-on laboratory projects and using process simulator SUPREM.

Prerequisite(s): ECE 584 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 698 - Independent Reading and Research

Credits: 1-3 (RD)
Independent study under the supervision of a faculty member, resulting in an acceptable technical report. No more than a combined total of 3 credits may be taken towards satisfying the master’s degree, although students may register for more credits. No more than a combined total of 3 credits may be taken of ECE 698 and ECE 798 towards satisfying the master’s degree, although students may register for more credits. Students may not count both ECE 799 and ECE 698 for master’s credit.

Prerequisite(s): Graduate standing, completion of at least two core courses, and permission of instructor.
Notes: Requires written report. May be taken no more than twice for graduate credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECE 699 - Advanced Topics in Electrical and Computer Engineering**

Credits: 1-6 (RT)
Advanced topics of current interest in electrical and computer engineering. Topics chosen so they do not duplicate other courses in department. Active participation encouraged in form of writing and presenting papers in research areas.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECE 721 - Nonlinear Systems**

Credits: 3 (NR)
Includes motivating examples; analysis techniques include basic fixed-point theory, implicit function theorem, and dependence of trajectories on initial data and parameters. Also covers computational simulation techniques; stability theory including Lyapnov's direct method; nonlinear control systems of input-output and absolute stability; strong positive real transfer functions; feedback linearization of nonlinear systems; nonlinear canonical forms; nonlinear decoupling; sliding control; and applications to adaptive control, neural networks, and robotics.

Equivalent to IT 846

Prerequisite(s): ECE 620 or ECE 621.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ECE 722 - Kalman Filtering with Applications**

Credits: 3 (NR)
Detailed treatment of Kalman Filtering Theory and its applications, including some aspects of stochastic control theory. Topics include state-space models with random inputs, optimum state estimation, filtering, prediction and smoothing of random signals with noisy measurements, all within the framework of Kalman filtering. Additional topics are nonlinear filtering problems, computational methods, and various applications such as global positioning system, tracking, system control, and others. Stochastic control problems include linear-quadratic-Gaussian problem and minimum-variance control.

Prerequisite(s): ECE 521 and 528 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECE 727 - System Identification and Adaptive Control

Credits: 3 (NR)
Advanced treatment. Topics include identification algorithms, their convergence and accuracy, and computational aspects; model reference and self-tuning adaptive control, transients, stability, and robustness; and intelligent schemes to improve robustness. Students required to study literature and complete computer project.

Prerequisite(s): ECE 621, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 728 - Random Processes in Electrical and Computer Engineering

Credits: 3 (NR)
Recommended for advanced master's and doctoral students. Provides background in random processes needed for pursuing graduate studies and research in statistical signal processing, communications, control, and computer networks. Covers probability spaces, random variables, Lebesque integration, conditional mean on a sigma field, convergence of random variables, limit and ergotic theorems, Markov processes, and Martingales.

Prerequisite(s): ECE 528 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

ECE 731 - Digital Communications

Credits: 3 (NR)
Digital transmission of voice, video, and data signals. Covers signal digitization, pulse code modulation, delta modulation, low bit-rate coding, multiplexing, synchronization, intersymbol interference, adaptive equalization, frequency spreading, encryption, transmission codes, digital transmission using band-width compression techniques, and satellite communications.

Prerequisite(s): ECE 630 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 732 - Mobile Communication Systems

Credits: 3 (NR)
Topics include modeling of mobile communication channel, signal set and receiver design for mobile communication channel, access and mobility control, mobile network architectures, connection to fixed network, and signaling protocols for mobile communication systems. Examples of mobile communication systems are presented, including pan-European GSM, North American D-AMPS, and personal communication systems.
Prerequisite(s): ECE 542 and 630.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 734 - Detection and Estimation Theory

Credits: 3 (NR)
Introduces detection and estimation theory with communication and radar and sonar applications. Topics include classical detection and estimation theory, detection of known signals in Gaussian noise, signal parameter and linear waveform estimation, and Wiener and Kalman filters.

Equivalent to IT 830

Prerequisite(s): ECE 528.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 737 - Spread Spectrum Communications

Credits: 3 (NR)
Introduces spread spectrum communications. Topics include pseudo noise spread spectrum systems, feedback shift registers, jamming strategy, code acquisition, synchronization, tracking, gold codes, burst-communication systems, time-hopping, frequency hopping, and multiple access communications.

Equivalent to IT 932

Prerequisite(s): ECE 630.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 738 - Advanced Digital Signal Processing

Credits: 3 (NR)
Theory and practice of advanced digital signal processing techniques. Topics may include efficient high-speed algorithms for convolution, correlation, orthogonal transforms, multirate processing of digital signals, multiresolution time-frequency and time-scale analysis of one- and two-dimensional signals, and multitaper spectral estimation.

Prerequisite(s): ECE 528 and ECE 535.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECE 741 - Wireless Networks

Credits: 3 (NR)
Theoretical foundation and practice in design of wireless networks. Emphasizes mobility and teletraffic modeling aspects, and networking issues and state-of-the-art performance evaluation methods of radio and system infrastructure applicable to wireless cellular and local networks. Topics include analysis of mobility, handoff, control traffic loading, resource allocation techniques, multiaccess protocols, admission policy and call control, network infrastructure and multilayer configuration, wireless LANs, and packet data systems.

Prerequisite(s): ECE 642 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 742 - High-Speed Networks

Credits: 3 (NR)
Theories for design, analysis and evaluation of high-speed networks including scalability, performance, and issues related to local area, metropolitan, and wide area networks. Includes architecture, protocols, and applications of high-speed networks; performance modeling of high-speed networks; flow control and routing; design issues for high-speed switches, interfaces, and controllers; all optical networks and their architectures; examples of high-speed computer networks and Internet working; video, imaging, and multimedia applications; software issues, robustness, and applications; and selected topics in current research areas in high-speed computer networks.

Equivalent to IT 834

Prerequisite(s): ECE 528 and 642, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 743 - Multimedia Networking and Communications Software

Credits: 3 (NR)
Advanced modern networks and services increasingly rely on communication protocols and their implementation in software. Course provides principle methodologies, constraints, and technologies for advanced store-and-forward or packet-switched communications nodes, networks and protocols, and emerging software-based applications. Specific examples include next-generation integrated Internet and Intranet, underlying transport infrastructure over wired and wireless media, switching and routing, multipoint and real-time multimedia and web-based services, and quality of services aspects.

Equivalent to IT 848

Prerequisite(s): ECE 642 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECE 744 - Computer Vision and Expert Systems

Credits: 3 (NR)
Brief review of image analysis. Includes vision system architectures such as human and computer visual systems; vision system operations such as focus and zooming; picture recognition languages; knowledge-based systems; learning algorithmic schemes; and applications to text processing and analysis as expert systems. Students conceive, simulate, and test design projects.

Prerequisite(s): ECE 644 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 745 - ULSI Microelectronics

Credits: 3 (NR)
Studies UltraLargeScaleIntegration (more than a million devices in a single chip) by considering limits of packing density, modeling of devices, and circuit topology. Semiconductor material and device physics imposed "second order effects" and limitations on deep submicron CMOS performance. Reliability studied through analytical (compact) modeling and numerical simulations. Presents and evaluates new ULSI technologies such as SOI CMOS.

Prerequisite(s): ECE 684.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 746 - Advanced Applied Cryptography

Credits: 3 (NR)
Discusses complex cryptographic algorithms and their implementations in software and hardware. Provides mathematical background necessary to understand, implement, and break modern cryptoalgorithms. Covers implementations of cryptosystems using smart cards, network processors, and other platforms. Discusses side channel attacks against implementations of cryptography, including timing attacks, power analysis, fault analysis, cache attacks, etc. Introduces advanced topics, such as random and pseudorandom number generators, secret sharing, zero-knowledge, and quantum cryptography. Requires a semester-long project devoted to implementation of selected algorithms or protocols in software or hardware, and/or comparative analysis of various algorithms, protocols, or implementations.

Prerequisite(s): ECE 646 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 749 - Neural Networks for Control

Credits: 3 (NR)
General neural network principles for control applications and supervised control, direct inverse control, neural adaptive control, backpropagation trout time (BTT), adaptive critics, sensorimotor principles. Topics include applications to adaptive control and

Equivalent to IT 844

**Prerequisite(s):** ECE 549 and 620.

**ECE 750 - Intelligent Systems for Robots**

Credits: 3 (NR)
Reviews recent developments in intelligent autonomous systems. Studies applications of artificial intelligence, control theory, operations research, decision sciences, computer vision, and machine learning to robotics as well as correspondences between various fields. Topics include analysis and design of methods, algorithms and architecture for planning, navigation, sensory data understanding, visual inspection, spatial reasoning, motion control, learning, self-organization, and adaptation to environment.

Equivalent to CS 685/SYST 672/IT 840

**Prerequisite(s):** SYST 611, ECE 650, or CS 580; or SYST 555 or equivalent.

**ECE 751 - Information Theory**

Credits: 3 (NR)
Introduces information theory, which is mathematical theory of communication systems. Topics include measures of information such as entropy, relative entropy, and mutual information; Shannon-McMillan-Breiman theorem and applications to data compression; entropy rate and source coding theorem; Huffman, arithmetic and Lempel-Ziv codes; method of types, channel capacity, and channel-coding theorem; joint source-channel coding theorem; differential entropy; Gaussian channel; rate distortion theory; and vector quantization.

Equivalent to IT 886

**Prerequisite(s):** ECE 528 or permission of instructor.

**ECE 752 - Spectral Estimation**

Credits: 3 (NR)
In-depth study of spectral analysis and application to statistical signal processing. Topics include classical Fourier analysis of deterministic signals and Wiener theory of spectral analysis for random processes; spectral estimation using Periodogram and
window approaches; maximum entropy spectral estimation and relation to autoregression modeling; signal subspace approaches for frequency estimation; and wavelet transform and elation to short-time Fourier transform.

Equivalent to IT 885

Prerequisite(s): ECE 528 or STAT 652, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 753 - Distributed Estimation and Multisensor Tracking and Fusion

Credits: 3 (NR)
Centralized and distributed estimation theory, hierarchical estimation, tracking and data association, multisensor multitarget tracking and fusion, distributed tracking in distributed sensor networks, track-to-track association and fusion, and Bayesian networks for fusion.

Prerequisite(s): ECE 734 or SYST 611.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 754 - Optimum Array Processing I

Credits: 3 (NR)

Prerequisite(s): ECE 528 and ECE 535.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 755 - Optimum Array Processing II

Credits: 3 (NR)
Adaptive beamformers, SMI and RLS estimators, spatial smoothing and FB averaging, QR decomposition, LMS algorithm, optimum detection and parameter estimation, UML and CML estimation, Cramer-Rao bounds, IQML, weighted subspace fitting, subspace algorithms such as MUSIC and ESPRIT, root versions, beam-space algorithms, sensitivity, robustness, and calibration.

Prerequisite(s): IT 837.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ECE 760 - Advances in Multi-Modeling

Credits: 3 (NR)
Focuses on the inter-operation of multiple models expressed in different modeling languages but which draw from the same data set: i.e., multi-modeling. Socio-technical systems often require a variety of modeling tools to define their operation accurately. An ontology based approach is used to analyze the validity of a proposed modeling architecture and workflow to address a specific issue.

Equivalent to SYST 740.

Prerequisite(s): ECE 673 or SYST 620 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring.

ECE 780 - High-Frequency Electronics

Credits: 3 (NR)
Studies devices and circuits in high-speed communications systems. Topics include microwave bipolar transistors and high-speed integrated circuits, and designing linear and power amplifiers using S-parameter techniques and computer simulation.

Equivalent to IT 845

Prerequisite(s): ECE 563 and 684, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ECE 798 - Research Project

Credits: 1-3 (RD)
Research project under the guidance of a faculty member, resulting in an acceptable technical report. No more than a combined total of 3 credits may be taken towards satisfying the master’s degree, although students may register for more credits. No more than a combined total of 3 credits may be taken of ECE 698 and ECE 798 towards satisfying the master’s degree, although students may register for more credits. Students may not count both ECE 799 and ECE 798 for master’s credit.

Prerequisite(s): 9 graduate credits and permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

ECE 799 - Master’s Thesis
Credits: 1-6 (RD)
Research project chosen and completed under guidance of graduate faculty member that results in technical report and oral defense acceptable to thesis committee of three faculty members.

Prerequisite(s): 9 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

ECE 836 - Special Topics in Statistical Signal Processing

Credits: 3 (RD)
Advanced topics in statistical signal processing in areas of current research interest. Topics may include detection, estimation, information theory, array processing, and underwater acoustics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ECE 899 - Research Topics in ECE

Credits: 3 (RD)
Studies advanced research areas in Electrical and Computer Engineering within a course format. Students will develop specialized research skills, which will also involve the presentation of their own work, developed individually and within groups. This course may be repeated for credit if the research areas differ.

Prerequisite(s): Completion of at least one 600 or 700 level course in the Research Topic area; and permission of instructor.

Notes: This will be an irregularly scheduled course intended for advanced master’s students who want to pursue a specific topic to more depth than a typical course offers at the master’s level. It will prepare students to undertake their individual research topics when they move on to pursue a Ph.D. program, or enter a research environment in their chosen professional careers.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ECE 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Work on research proposal that forms basis for doctoral dissertation.

Notes: May be repeated. No more than 24 credits of ECE 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only
ECE 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Formal record of commitment to doctoral dissertation research under direction of ECE faculty member.

Prerequisite(s): Admission to candidacy.

Notes: May be repeated as needed. Students must complete minimum 12 credits of doctoral proposal (ECE 998) and doctoral dissertation research (ECE 999) Maximum of 24 credits of ECE 998 and 999 may be applied to degree. Students who choose to take less than 24 credits of ECE 998 and 999 may earn remaining credits from approved course work. Students cannot enroll in ECE 999 before research proposal accepted and approved by dissertation committee.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
Grading: Satisfactory/No credit only

Elementary/Secondary Education (EDCI)

Offered by the College of Education and Human Development

EDCI 370 - Young Adult Literature in Multicultural Settings

Credits: 3 (NR)
Examines literary works written for and about young adults, introduces critical issues surrounding teaching of young adult literature in multiculturally diverse schools, and requires reading and review of young adult literature.

Notes: Significant online work is required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 372 - Teaching Mathematics in the Secondary School

Credits: 3 (NR)
Covers curricula, current issues, and research literature in secondary school mathematics. Emphasis is on developing different styles of teaching. Field experience is required for those seeking initial teacher licensure.

Corequisite(s): EDUC 422

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 469 - Teaching English in Secondary School
EDCI 472 - Advanced Methods for Teaching Mathematics in the Secondary School

Credits: 3 (NR)
Focuses on learning processes for mathematics. Introduces national and state standards regarding content and methodologies for teaching mathematics. Examines instructional methods and materials in relation to secondary mathematical content, curriculum, and assessment.

Prerequisite(s): EDCI 372, EDUC 422.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

EDCI 473 - Teaching Science in the Secondary School

Credits: 3 (NR)
Builds fundamental knowledge of science teaching and learning including standards-based curriculum design and research-based teaching strategies.

Prerequisite(s): Admission to the Secondary Education Program.

Notes: School-based field experience required for those seeking initial teacher licensure.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 479 - Advanced Methods of Teaching English in the Secondary School

Credits: 3 (NR)
Guides students in working effectively with national and local standards for teaching secondary English. Continuation course in methods from EDCI 469.

Prerequisite(s): EDCI 469.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDCI 483 - Advanced Methods of Teaching Science in Secondary School

Credits: 3 (NR)
Provides advanced study of teaching and curriculum development based on research and current issues. Emphasizes integrating science and technology, adapting instruction to needs of diverse learners, and promoting safety.

Prerequisite(s): EDCI 473.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 490 - Student Teaching in Education

Credits: 6 (NR)
Provides intensive, supervised clinical experience in approved school for fall or spring semester.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion of licensure and all endorsement course work

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0
Grading: Undergraduate Special

EDCI 500 - In-Service Educational Development

Credits: 1-6 (NR)
Offered at request of school division or other educational agency.

Notes: Content varies; may be repeated for credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDCI 510 - Linguistics for PreK-12 ESOL Teachers

Credits: 3 (NR)
Examines language as a system, with particular focus on teaching English as a second language (ESOL) to students in public schools, grades PreK-12. Considers teaching implications of phonology, morphology, syntax, semantics, and pragmatics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDCI 511 - Developing Curriculum and Designing Instruction in Early Childhood Education

Credits: 3 (NR)
Covers procedures, materials, and organization of environments for young children.

Notes: Field experiences required for students without previous teaching or administrative experience in early childhood settings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 516 - Bilingualism and Language Acquisition Research

Credits: 3 (NR)
Examines research in first and second language acquisition, including interaction of bilingual person's two languages, with applications for classroom.

Corequisite(s): EDCI 560

Notes: School-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 519 - Methods of Teaching Multilingual Students

Credits: 3 (NR)
Examines approaches, methods, and techniques for teaching English as second language (ESL) in bilingual and ESL classrooms, as well as resources available in field. Participants critically analyze and demonstrate teaching approaches based on second language acquisition research, including teaching language through content.

Prerequisite(s): EDCI 516.

Notes: Field experience in public schools required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 520 - Assessment of Language Learners

Credits: 3 (NR)
Examines innovative approaches to assessing language minority students and English language learners. Topics include identification, placement, monitoring of student progress, development of authentic performance-based measures, design of portfolios, application of measurement concepts, analysis of assessment instruments, and linking assessment to instruction.
Prerequisite(s): EDCI 516 and 519.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 521 - Curriculum Development for Language Learners

Credits: 3 (NR)
Examines current approaches to curriculum development for second language learners and language minority students. Participants review, evaluate, and develop curricular materials, with emphasis on learner-centered activities, cooperative learning, interdisciplinary and thematic approaches, authentic and problem-based learning, integration of language and content, and linking assessment and instruction.

Prerequisite(s): EDCI 516 and 519.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 544 - Curriculum and Methods of Teaching in Elementary Education

Credits: 3 (NR)
Introduction to general methods of teaching in elementary schools focusing on planning, teaching strategies, management, assessment, and differentiation.

Prerequisite(s): Admission into elementary education graduate program; must be taken in programmatic sequence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 545 - Assessment and Differentiation

Credits: 3 (NR)
Provides a research-based introduction to differentiated instruction for children in grades PK-6. Emphasis on the assessment of learners and differentiation of instruction to meet the needs of all learners.

Prerequisite(s): Admission into elementary education graduate program; must be taken in programmatic sequence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 546 - Integrating Technology in Elementary Classrooms: Literacy
EDCI 547 - Integrating Technology in Elementary Classrooms: Mathematics

Credits: 1 (NR)
Studies the development and integration of technology in the elementary education mathematics curriculum.

Prerequisite(s): Admission into elementary education graduate program.

Corequisite(s): EDCI 552.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDCI 548 - Integrating Technology in Elementary Classrooms: Social Studies and Fine Arts

Credits: 1 (NR)
Studies the development and integration in the elementary education social studies and fine arts curriculum.

Prerequisite(s): Admission into elementary education graduate program.

Corequisite(s): EDCI 554.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDCI 549 - Foreign Language Immersion in the Elementary School

Credits: 3 (NR)
Covers theories and methods of teaching foreign language through elementary school curriculum; and curriculum development, assessment, and community relations in foreign language immersion classes.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDCI 552 - Mathematics Methods for the Elementary Classroom

Credits: 1-3 (RD)
Introduces methods for teaching all children topics in arithmetic, geometry, algebra, probability, and statistics in elementary grades. Focuses on using manipulatives and technologies to explore mathematics and solve problems.

Prerequisite(s): Admission to elementary education licensure program.

Notes: Requires field experience in public schools.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 553 - Science Methods for the Elementary Classroom

Credits: 1-3 (RD)
Develops skills and abilities in science teaching methods, applications of technology, safety practices, and creation of integrated science curricula. Examines science teaching based on contemporary theory, practice, and standards.

Prerequisite(s): Admission to elementary education licensure program.

Notes: Requires field experience in public schools.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 554 - Methods of Teaching Social Studies and Integrating Fine Arts in the Elementary Classroom

Credits: 3 (RD)
Focuses on the design and delivery of standards-based integrated curriculum centered on the social sciences. Includes integration of fine arts and examines the central role of the arts in learning.

Prerequisite(s): Admission into elementary education graduate program; must be taken in programmatic sequence.

Notes: Field experience is required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 555 - Literacy Teaching and Learning in Diverse Elementary Classrooms I
EDCI 556 - Literacy Teaching and Learning in Diverse Elementary Classrooms II

Credits: 1-3 (RD)
Provides research-based introduction to literacy teaching and learning for older children. Emphasizes literacy and language processes and development; connections among cultures, families, and literacy; and literacy integration in curriculum.

Prerequisite(s): Admission to elementary education licensure program

Notes: School-based field experience required.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

EDCI 557 - Integrating Technology in the Elementary Curriculum

Credits: 3 (NR)
Examines development and implementation of curriculum and instruction in elementary classroom. Emphasizes integrating technology in curriculum, and inclusion of special needs and culturally diverse students.

Prerequisite(s): Admission to elementary education licensure program

Notes: School-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 558 - Integrating Fine Arts and Movement in Elementary Education

Credits: 3 (NR)
Includes art, drama, music, and movement. Examines central role of arts in children's learning. Focuses on integration and interdisciplinary learning experiences. Includes developmental theory, addressing diverse learners through multiple intelligences, and movement for physical health.

Prerequisite(s): Admission to PDS or Partnership Elementary Licensure Program.
Notes: School-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDCI 559 - Research and Assessment in Elementary Education**

Credits: 3 (NR)
Provides teacher candidates an understanding of research paradigms utilizing systematic evidence to improve practice and further skills in assessment of learning outcomes. Emphasizes linking research and practice, making instructional decisions based on systematically collected data.

Prerequisite(s): Admission into elementary education graduate program; capstone course for degree must be taken last in programmatic sequence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDCI 560 - Methods of Teaching in Foreign/World Languages**

Credits: 3 (NR)
Covers approaches, theories, and methods of teaching foreign and second languages, with practical application to classroom. Students demonstrate teaching strategies, develop lesson and unit-planning skills, and evaluate curricula and materials.

Corequisite(s): EDCI 516

Notes: Requires field experience in schools.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDCI 567 - Teaching Social Studies in the Secondary School**

Credits: 3 (NR)
Advanced course in methods, materials, content, and organization of social studies programs in secondary schools.

Prerequisite(s): EDUC 522 and 15 hours school-based field experience

Corequisite(s): EDUC 522 and 15 hours school-based field experience

Notes: Requires field experience for those seeking initial teacher licensure.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDCI 569 - Teaching English in the Secondary School

Credits: 3 (NR)
Provides study of advanced methods, materials, content, and organization of English programs in secondary school.

Prerequisite(s): EDUC 522.

Corequisite(s): EDUC 522.

Notes: 15 hours school-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 570 - Teaching Young Adult Literacy in a Multicultural Setting

Credits: 3 (NR)
Examines literary works written for and about young adults. Introduces critical issues surrounding teaching young adult literature in multiculturally diverse public schools and requires reading and reviewing young adult literature from several genres.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 572 - Teaching Mathematics in the Secondary School

Credits: 3 (NR)
Emphasizes developing different styles of teaching.

Prerequisite(s): EDUC 522.

Corequisite(s): EDUC 522.

Notes: 15 hours school-based field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 573 - Teaching Science in the Secondary School

Credits: 3 (NR)
Provides study of methods, materials, content, and organization of science programs. Emphasizes curriculum planning, current methodologies, safety, and trends in secondary schools. Designated a Green Leaf Course.

Prerequisite(s): EDUC 522.
Corequisite(s): EDUC 522.

Notes: 15 hours school-based field experience required.

EDCI 577 - Curriculum and Methods of Teaching, PK-12

Credits: 3 (RD)
Blends theory and practice by providing instruction in curriculum and planning, theoretical concepts, application of research, models of learning and teaching, and practical experiences. Examines educational standards, assessment, and classroom management in PK-12 schools.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 597 - Special Topics in Education

Credits: 1-6 (RD)
Provides advanced study on selected topic or emerging issue in American or international education.

Prerequisite(s): Admission to program in GSE.

Notes: May be repeated for credit with GSE permission.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 600 - Workshop in Education

Credits: 1-6 (NR)
Offers full-time workshops and weekend seminars on selected topics in education and education tour seminars.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDCI 601 - Applied Study of Communicative Competence and Classroom Discourse
Credits: 3 (NR)
Analyzes young children's language development and design of individual and group language experiences.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 602 - Technology Applications in Early Childhood Education

Credits: 3 (NR)
Examines criteria and methods for integrating technology into all areas of early childhood curriculum. Emphasizes use of instructional technology to facilitate cognitive and social growth.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 603 - Trends, Issues, and Research in Early Childhood Education

Credits: 3 (NR)
Examines trends, issues, research findings, and resulting program development.

Prerequisite(s): Admission to GSED.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 613 - Curriculum and Assessment in Early Childhood Education I

Credits: 3 (NR)
First of two-course sequence addressing current thinking about curriculum and assessment in programs for preschool through third grade. Gives overview of effective ways to plan and implement integrated curriculum; special focus on content, subject matter.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 614 - Curriculum and Assessment in Early Childhood Education II

Credits: 3 (NR)
Second of two-course sequence focusing on planning and assessing children's knowledge of content and subject matter. Emphasizes action research.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDCI 615 - Advanced Human Development

Credits: 3 (NR)
Advanced course in development and learning across lifespan. Critically reviews contemporary research and theories of human development and learning, and relevance to educational practice and family contexts as they relate to children under eight.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 616 - The Creative Arts and Play in Early Childhood Education

Credits: 3 (NR)
Advanced course using creative arts and play as central approaches to teaching and learning. Focuses on an integrated approach to what arts-based curriculum looks like and how it functions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 617 - Using Digital and Popular-Culture Media with Grades 4-12

Credits: 3 (NR)
Exposes students to recent knowledge on how middle and high school teachers can use digital media and popular culture texts to engage students in subject area learning or literacy development. Focus is on grades 4-12.

Prerequisite(s): Admission to a GSE licensure, Master's, or doctoral program and at least one year of PK-12 teaching experience, completion of EDCI 569, EDCI 567, EDCI 572, EDCI 573, or EDCI 544, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer

EDCI 621 - Introduction to Gifted and Talented Learners

Credits: 3 (NR)
Examines nature and needs of gifted and talented learners. Participants become knowledgeable about characteristics of gifted and talented students, and examine role of culture in manifestation of gifts and talents as well as gifted behaviors in special populations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 622 - Curriculum Differentiation for Diverse Learners
Develops personal and professional rationale for differentiating instruction in mixed-ability classrooms, as well as skills and knowledge of strategies to utilize pre-assessment data and plan for and implement differentiated instruction.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCI 623 - Models and Strategies for Teaching Gifted Learners**

Credits: 3 (NR)  
Provides framework to examine and apply curriculum models and instructional strategies advocated for use with gifted students according to national and state standards that reflect best practices in gifted education.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCI 624 - Assessment, Identification, and Evaluation of Gifted Learners**

Credits: 3 (NR)  
Examines broad understandings of intelligence and assessment. Provides techniques to identify gifted students. Develops specific understandings of assessment techniques and awareness of the influences of language, culture, ethnicity, gender, and exceptionality on recognition and subsequent identification of giftedness.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCI 625 - Contemporary Issues and Trends in Gifted Education**

Credits: 3 (NR)  
Focuses on research, trends, issues, legislation, and litigation concerning gifted and talented children. Provides professionals in gifted education and related fields with knowledge and skills to serve as advocates for gifted-child education.

**Prerequisite(s):** EDCI 621, 622, 623, 624.  
**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCI 626 - Action Research in Gifted Education**

Credits: 3 (NR)  
Opportunity to identify and investigate school-based problem and apply inquiry, writing, and research skills to relevant issue or concern in gifted education.
**EDCI 627 - Advanced Practicum in Gifted Education**

Credits: 3 (NR)
Intensive supervised clinical experiences for one semester in accredited elementary or secondary school. Students supervised in setting that includes scheduled observations and seminar experiences.

Prerequisite(s): EDCI 621, 622, 623, 624.

**EDCI 631 - Research in Elementary Education**

Credits: 3 (NR)
Helps beginning teachers understand various research paradigms to use research literature and systemic evidence to improve practice. Emphasizes linking research and practice, and making data-based instructional decisions.

Prerequisite(s): Completion of elementary education (PK-6) licensure.

**EDCI 632 - Advanced Social Studies Methods for the Elementary Classroom**

Credits: 3 (NR)
Provides advanced study of teaching social studies in elementary education. Uses inquiry, research, and reflection to improve teaching. Emphasizes design and delivery of integrated social studies curriculum centered on knowledge, skills, and dispositions from history, geography, civics and economics, arts and humanities, and multicultural education. Covers student assessment and using student data in instructional decision-making and improvement.

Prerequisite(s): Completion of elementary education (PK-6) licensure, and EDCI 631.

Notes: Requires extensive field experience in public schools.

**EDCI 633 - Advanced Mathematics Methods for the Elementary Classroom**
Credits: 3 (NR)
Focuses on teaching all children, including those from nonmainstreamed populations. Emphasizes teaching problem-solving and higher-order thinking skills promoted by National Council of Teachers of Mathematics and Virginia Mathematics Standards of Learning. Uses techniques and materials to develop specific problem-solving strategies in hands-on, activity, and workshop-oriented experience. Explores teaching of problem-solving, reasoning, communications, and connections in PK-6 mathematics by working with manipulatives and technologies.

Prerequisite(s): Completion of elementary education (PK-6) licensure, and EDCI 631.

Notes: Requires field experience in public schools.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 634 - Advanced Science Methods for the Elementary Classroom

Credits: 3 (NR)
Emphasizes inquiry and extensions of theoretical understanding of how children learn. Develops expertise in teaching and assessment, and incorporates technology, safety, and issues of culture and gender into day-to-day teaching activities.

Prerequisite(s): Completion of elementary education (PK-6) licensure, and EDCI 631.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 635 - Applied Research in Elementary Education

Credits: 3 (NR)
Helps beginning teachers plan and complete action research project related to teaching assignment. Students apply research methods explored during prerequisite series of courses.

Prerequisite(s): Completion of elementary education (PK-6) licensure; and EDCI 631, 632, 633, and 634.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 644 - Mathematics Learning and Assessment (K-8)

Credits: 3 (NR)
Introduces students to learning theories and associated assessment practices specific to mathematics education. Intended for mathematics specialists and teachers interested in problems of learning and assessment across K-8 settings in mathematics education.

Prerequisite(s): Admission to the MEd in Education Leadership Mathematics Education Leadership concentration

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDCI 645 - Curriculum Development in Mathematics Education

Credits: 3 (NR)
Analysis, design, and evaluation of school mathematics curricula.

Prerequisite(s): Admission to mathematics education leadership master's degree program, or permission of instructor.

Notes: Yearlong seminar for master's-level students in mathematics education leadership cohort program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 646 - Mathematics Education Leadership for School Change

Credits: 1-3 (NR)
Surveys current literature and large-scale studies in mathematics education. Engages students in research, study, and discussion of factors that affect teaching and learning of mathematics in school settings.

Prerequisite(s): Admission to mathematics education leadership master's degree program, or permission of instructor.

Notes: Yearlong seminar for master's-level students in mathematics education leadership cohort program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 663 - Research in Science Teaching

Credits: 3 (NR)
Investigates the research and methodology involved in teaching and learning biological, chemical, physical, and earth sciences from K-12.

Prerequisite(s): Course in teaching science in elementary or secondary school, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 666 - Research in Mathematics Teaching

Credits: 3 (NR)
Explores curricula, current issues, and research literature in elementary school mathematics. Emphasizes development of different styles of teaching.
EDCI 667 - Advanced Methods of Teaching Social Sciences in the Secondary School

Credits: 3 (NR)
Emphasizes interdisciplinary curriculum and instruction, implementing national state standards, authentic assessment, and adaptations for diverse populations.

Prerequisite(s): EDCI 567 and EDUC 522. 15 hours school-based field experience required.

Notes: School-based field experience required.

EDCI 669 - Advanced Methods of Teaching English in the Secondary School

Credits: 3 (NR)
Continuation course in methods (See EDCI 569). Guides students in working effectively with national and local standards for teaching secondary English.

Prerequisite(s): EDCI 569 and EDUC 522. 15 hours school-based field experience required.

EDCI 672 - Advanced Methods of Teaching Mathematics in the Secondary School

Credits: 3 (NR)
Focuses on learning processes for mathematics. Introduces national and state standards regarding content and methodologies for teaching mathematics. Examines instructional methods and materials in relation to secondary mathematical content, curriculum, and assessment.

Prerequisite(s): EDCI 572, EDUC 522. 15 hours school-based field experience required.

EDCI 673 - Advanced Methods of Teaching Science in the Secondary School

Credits: 3 (NR)
Provides advanced study of teaching and curriculum development based on research and current issues. Emphasizes integrating
science and technology, and adapting instruction to the needs of diverse learners.

**Prerequisite(s):** EDCI 573 and EDUC 522. 15 hours school-based field experience required.

**EDCI 677 - Advanced Curriculum and Methods of Teaching, Secondary**

Credits: 3 (NR)
Includes application of skills in discipline-specific methodology, communication, classroom management, and evaluation of student performance appropriate to elementary level.

**Prerequisite(s):** EDCI 577.

**Notes:** Extends principles of teaching and learning introduced in EDCI 577.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCI 678 - Advanced Curriculum and Methods of Teaching, Elementary**

Credits: 3 (RD)
Includes application of skills in discipline-specific methodology, communication, classroom management, and evaluation of student performance appropriate to elementary level.

**Prerequisite(s):** EDCI 577

**Notes:** Extends principles of teaching and learning introduced in EDUC 577.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDCI 683 - Curriculum Development and Evaluation in Science Education**

Credits: 3 (NR)
Advanced course in science curriculum design and development. Emphasizes instructional materials and assessment.

**Prerequisite(s):** EDCI 663, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

**EDCI 684 - Advanced Methods of Teaching Foreign/Second Languages in PK-12 Schools**
EDCI 693 - Leadership and Organizational Issues in Science Education

Credits: 3 (NR)
Advanced course in current issues for leadership in science education. Emphasizes technology, safety, professional development, and related organizational change issues.

Prerequisite(s): EDCI 663 and 683, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 705 - Instructional Design

Credits: 3 (NR)
Helps students analyze, apply, and evaluate principles of instructional design to develop education and training materials spanning a wide range of knowledge domains and instructional technologies. Focuses on variety of instructional design models, with emphasis on recent contributions from cognitive science and related fields.

Equivalent to EDIT 705

Prerequisite(s): Teaching experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDCI 710 - Technology and the Culture of Schools

Credits: 3 (RD)
Explores relationship of human inventions and social, political, cultural, and epistemological constructions. Examines history of technology, relationship of technology and human behavior, and theories of social change and technology. Focuses on how technological and social changes influence and shape goals and outcomes of K-12 educational process. Considers links between technology and educational reform, how technology is associated with educational reform movement, and ways educators can take leadership roles in facilitating intersection of educational reform and technology.

Corequisite(s): EDIT 711.
EDCI 712 - Technology and Learning

Credits: 3 (RD)
Explores ways of knowing and theories of learning as reflected in and influenced by technology. Analyzes, applies, and evaluates current theories such as constructivism, multiple intelligences, role of symbolization in human cognition, development of problem-solving and critical thinking strategies, and learning conditions. Covers relationship of technological forms and nature and structure of human cognition, especially as it influences K-12 educational practice. Explores technology and nature of individual learner attributes, learners in context, special-needs learners, access, equity, and values.

Corequisite(s): EDIT 713.

EDCI 714 - Methods of Integration

Credits: 3 (RD)
Includes examples of curriculum design strategies, readings, discussions, and design of lessons or units appropriate to various contents. First course in sequence focuses on disciplinary standards, role of technology applications to support standards, and strategies for curriculum design such as learning cycle, thematic design, interdisciplinary and transdisciplinary approaches, and writing across the curriculum.

Corequisite(s): EDIT 715. Considers curriculum design strategies that facilitate technology integration.

EDCI 716 - Principles of Technology Leadership

Credits: 3 (NR)
Focuses on the relationship of leadership, change, and technology advocacy with emphasis on leadership roles for technology educators.

Corequisite(s): EDIT 719

EDCI 725 - National and International Leadership Issues in Mathematics Education
Credits: 3 (NR)
Students study research on mathematics teaching and learning, including current issues and trends in mathematics education leadership at national and international levels.

Prerequisite(s): Admission to mathematics education leadership PhD program.

Notes: Yearlong seminar for PhD students in the mathematics education leadership cohort program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 726 - State and Local Leadership Issues in Mathematics Education

Credits: 3 (NR)
Students study issues and policies that affect mathematics teaching and learning, including current trends in mathematics school reform at state, district, and individual school levels.

Prerequisite(s): Admission to mathematics education leadership PhD program.

Notes: Yearlong seminar for PhD students in the mathematics education leadership cohort program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 777 - Research to Practice

Credits: 3 (NR)
Provides culminating experience that synthesizes and applies essential elements of second language teaching and learning. Emphasizes teacher as change agent through critical inquiry into practice. Promotes collaboration between ESL and grade-level teachers to advance achievement of English language learners and language minority students.

Prerequisite(s): All other program courses except EDRS 590 and elective, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 784 - Capstone Seminar in Early Childhood Education

Credits: 3 (NR)
Culminating seminar devoted to analyzing and synthesizing knowledge and skills gained through graduate course work as it applies to early childhood education.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDCI 790 - Internship in Education

Credits: 1-6 (RD)
Intensive, supervised clinical experience for full semester in accredited school. Students must register for appropriate section.

Prerequisite(s): EDUC 522, EDUC 672, two methods classes in content area; passing Praxis II and VCLA, completing all endorsements.

Corequisite(s): EDRD 619

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

EDCI 795 - Science Education Research

Credits: 3 (NR)
Explores science education research, theory, and practice, including sources and methods of study. Students review and report on research literature and teaching practices on topics of interest.

Prerequisite(s): EDCI 891.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 796 - Science Education Curriculum

Credits: 3 (NR)
Explores science education curriculum from preschool through high school, including identifying and evaluating curriculum materials and resources. Emphasizes research-based exemplary materials and use of technology.

Prerequisite(s): EDCI 891.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 797 - Advanced Topics in Education

Credits: 1-6 (NR)
Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.
Notes: May be repeated for credit with CEHD approval.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 810 - Foundations of Science Education Research

Credits: 3 (NR)
Explores and analyzes the range of research designs currently utilized by science education researchers. Develops an understanding of the assumptions and frameworks of different types of science education inquiry through an examination of ways of knowing. Examines historical trends that have taken place in science education.

Prerequisite(s): Admission to Ph.D. in Education Science Education Research Concentration.

Corequisite(s): EDUC 800.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

EDCI 811 - Current Trends in Science Education Research

Credits: 3 (NR)
Provides an in-depth examination and analysis of literature and research in science education. Examines theoretical foundations of research studies in science education, discusses methodologies of research, critique research, and examines trends in emerging science education research. Includes presentations by science education researchers as well as opportunities for graduate students to explore research ideas with colleagues within the class.

Prerequisite(s): EDCI 810.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring.

EDCI 813 - Focused Science Education Research

Credits: 3 (NR)
Provides an opportunity for students to gain hands-on experience designing and conducting a research study in science education that leads to publication and/or conference presentations. The scholarship embodied in student development to this point in the doctoral program will lead students to work with a science education faculty member of their choice to development and seek to answer a research question of interest.

Prerequisite(s): EDRS 810, EDRS 811, EDRS 827.

Hours of Lecture or Seminar per week: 3
EDCI 855 - Mathematics Education Research on Teaching and Learning

Credits: 3 (NR)
Students survey most current research literature in mathematics education and engage in research, study, and discussion of mathematics education research on teaching and learning in school settings.

Prerequisite(s): Admission to mathematics education leadership PhD program.

Notes: Yearlong seminar for PhD students in the mathematics education leadership cohort program.

EDCI 856 - Mathematics Education Curriculum Design and Evaluation

Credits: 3 (NR)
Students engage in research, analysis, design, and evaluate school mathematics curricula.

Prerequisite(s): Admission to mathematics education leadership PhD program.

Notes: Yearlong seminar for PhD students in the mathematics education leadership cohort program.

EDCI 857 - Preparation and Professional Development of Mathematics Teachers

Credits: 3 (NR)
Students study attributes of effective professional development in mathematics education, develop expertise in designing and teaching mathematics methods courses, and learn to create and teach professional development experiences for practicing teachers.

Prerequisite(s): Admission to mathematics education leadership PhD program.

Notes: Yearlong seminar for PhD students in the mathematics education leadership cohort program.
EDCI 858 - Mathematics Education Research Design and Evaluation

Credits: 3 (NR)
Students review methods of research appropriate for mathematics education settings and develop theoretical framework and action plan for conducting research project.

Prerequisite(s): Admission to mathematics education leadership PhD program.

Notes: Yearlong seminar for PhD students in the mathematics education leadership cohort program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 891 - Science Teaching and Learning

Credits: 3 (NR)
Explores research, theory, and practice for effective science teaching and learning. Focuses on science education standards at local, state, national, and international levels. Students review common core of research literature and topics of individual interest.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 892 - Science Education History and Research

Credits: 3 (NR)
Explores history of science education research, theory, and practice, including research on general teaching strategies in science instruction. Reviews common historical core of research literature; students conduct exploratory research of individual interest.

Prerequisite(s): EDCI 891.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDCI 893 - Science Education Staff Development

Credits: 3 (NR)
Explores staff development in science education with emphasis on planning and conducting professional development on key topics in science teaching and learning. Reviews common core of research literature; students conduct research of individual interest.

Prerequisite(s): EDCI 891.
EDCI 894 - Science Education Leadership and Policy

Credits: 3 (NR)
Focuses on leadership and policy issues at local, state, and national levels that affect science education. Emphasizes understanding decision-making structure and process; current issues; and trends. Students participate in leadership and policy events.

Prerequisite(s): EDCI 891.

EDCI 895 - Emerging Issues in Curriculum and Instruction

Credits: 3 (NR)
Covers issues in curriculum and instruction through individual and group research, discussion, writing, and presentations by experts. Students conduct critical analysis of specific field.

Prerequisite(s): Admission to PhD program, or permission of instructor.

Engineering (ENGR)

Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.

ENGR 107 - Introduction to Engineering

Credits: 2 (NR)
Introduces engineering profession fundamentals and problem-solving. Topics include description of engineering disciplines, functions of the engineer, professionalism, ethics and registration, problem solving and representation of technical information, estimation and approximations, and analysis and design.

Fulfills general education requirement in information technology (ethics only).
Corequisite(s): MATH 105, or Math Placement Test score qualifying student for MATH 113.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ENGR 307 - Engineering Thermodynamics

Credits: 3 (NR)
Classical concepts of energy and temperature, first and second laws and their application to closed and open thermodynamic systems. Covers properties of pure substances, equation of state, and analysis of thermodynamic processes and systems. Presents application to engineering systems.

Prerequisite(s): Grade of C or better in MATH 213 and PHYS 266. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGR 498 - Independent Study in Engineering

Credits: 1-3 (RT)
Directed self-study of special topics of current interest in ENGR.

Prerequisite(s): 60 credits; must be arranged with instructor and approved by department chair before registering.

Notes: May be repeated for maximum 6 credits if topics substantially different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGR 499 - Special Topics in Engineering

Credits: 0-4 (RT)
Topics of special interest to undergraduates.

Prerequisite(s): 60 credits and permission of instructor; specific prerequisites vary with nature of topic.

Notes: May be repeated for maximum 6 credits if topics substantially different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

English (ENGH)

Offered by the College of Humanities and Social Sciences
Effective 2011-2012 Catalog, the English course prefix has changed from ENGL to ENGH.

Prerequisite to all 200-level and above: 3 credits of 100-level English. Prerequisite to all English courses numbered above 302 unless otherwise noted: 3 credits of 100-level English and 3 credits of general education literature. Nonnative speakers of English with limited language proficiency are encouraged to take ENGH 100 instead of ENGH 101. Students may not receive credit for both ENGH 100 and 101.

**ENGH 100 - Composition for Non-native Speakers of English**

Credits: 4 (NR)
Intensive practice in drafting, revising, and editing expository essays of some length and complexity. Studies logical, rhetorical, and linguistic structure of expository prose, with attention to particularly difficult aspects of the language for non-native speakers. Methods and conventions of preparing research papers.

Fulfills general education requirement in written communication (lower level).

Equivalent to ENGH 122; ENGL 122 and ENGL 100 (2010-2011 Catalog)

**Notes:** For non-native English speakers with limited language proficiency. Students must attain minimum grade of C to fulfill degree requirements.

Hours of Lecture or Seminar per week: 4  
Hours of Lab or Studio per week: 0  
Grading: Undergraduate Special

**ENGH 101 - Composition**

Credits: 3 (NR)
Intensive practice in drafting, revising, and editing expository essays of some length and complexity. Studies logical, rhetorical, and linguistic structure of expository prose. Methods and conventions of preparing research papers.

Fulfills general education requirement in written communication (lower level).

Equivalent to ENGH 122; ENGL 122 and ENGL 101 (2010-2011 Catalog)

**Notes:** Students must attain minimum grade of C to fulfill degree requirements.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
Grading: Undergraduate Special

**ENGH 121 - Enhanced Composition For Multilingual Writers of English I**

Credits: 3 (NR)
Provides intensive practice in drafting, revising, and editing essays in common academic genres such as description, exposition, and analysis, with additional language support for building English fluency. Addresses logical, rhetorical, and linguistic structures of expository prose. This course is the first of a two-part course for students in the ACCESS program.
**Prerequisite(s):** Admission to the ACCESS program for international Students.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Undergraduate Special.

### ENGH 122 - Enhanced Composition For Multilingual Writers of English II

Credits: 3 (NR)  
Provides intensive practice in drafting, revising and editing essays in common academic genres such as argumentation and research based writing, with additional language support for building English fluency. Addresses logical, rhetorical, and linguistic structures of expository prose, and builds critical reading strategies. This course is the second of a two-part course for students in the ACCESS program.

Equivalent to ENGH 100, ENGH 101; ENGL 100, ENGL 101 (2010-2011 Catalog)

**Prerequisite(s):** Satisfactory progress in ENGL 121/ENGH 121.

**Notes:** Students must attain minimum grade of C to fulfill general education degree requirement for written communication (lower level).

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Undergraduate Special.

### ENGH 201 - Reading and Writing about Texts

Credits: 3 (NR)  
Close analysis of literary texts, including but not limited to poetry, fiction, and drama. Emphasizes reading and writing exercises to develop basic interpretive skills. Examines figurative language, central ideas, relationship between structure and meaning, narrative point of view.

Fulfills general education requirement in literature.

Equivalent to ENGL 201 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 202 - Texts and Contexts

Credits: 3 (NR)  
Studies literary texts within the framework of culture. Examines texts within such categories as history, gender, sexuality, religion, race, class, and nation.
ENGH 203 - Western Literary Tradition

Credits: 3 (NR)
Major works of Western literature in historical progression. Focuses on writers such as Homer, Sophocles, Euripides, Dante, Cervantes, Machiavelli, and Montaigne.

Fulfills general education requirement in literature.

Equivalent to ENGL 203 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English.

Notes: All readings are in modern English. Courses build on reading and writing skills taught in ENGH 201.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 204 - Western Literary Traditions

Credits: 3 (NR)
Major works of Western literature in historical progression. Covers writers such as Moliere, Mme. de Lafayette, Goethe, Ibsen, Flaubert, Dostoyevski, Tolstoy, Mann, Kafka, Borges, and Soyinka. All readings are in modern English.

Fulfills general education requirement in literature.

Equivalent to ENGL 204 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English.

Notes: Courses build on reading and writing skills taught in ENGH 201.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 300 - Cover to Cover
Credits: 3 (RD)
Introduction to various topics in English; many have an interdisciplinary emphasis. Appropriate for non-majors. Topic changes each time course is offered.

Equivalent to ENGL 300 (2010-2011 Catalog)

Prerequisite(s): ENGL 101/ENGH 101

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ENGH 302 - Advanced Composition

Credits: 3 (NR)
Intensive practice in writing and analyzing expository forms such as essay, article, proposal, and technical or scientific reports with emphasis on research related to student’s major field.

Fulfills general education requirement in written communication (upper level).

Equivalent to ENGL 302 (2010-2011 Catalog)

Prerequisite(s): Completion of 45 credits including general education composition and general education literature, requires a grade of C or better.

Notes: Schedule of Classes designates particular sections of ENGH 302 in business, humanities, natural sciences and technology, and social sciences.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 304 - Topics: Literary Surveys

Credits: 3 (RT)
Advanced introduction to major movements and representative figures of two or more centuries or periods of American, British, European, or world literature.

Equivalent to ENGL 345 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**ENGH 305 - Dimensions of Writing and Literature**

Credits: 6 (NR)
Examines English as a discipline and develops interpretive skills for further study in the major. All sections cover issues such as form, genre, point of view, figurative language, conventions of close reading and literary interpretation, and how culture shapes texts.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

Equivalent to ENGL 325 (2010-2011 Catalog)

**Prerequisite(s):** 6 credits in literature. Students must register for a lecture section and the recitation section (301).

**Notes:** Open to all students. Required of those majoring or minoring in English, who should take ENGH 305 before taking other 300- or 400-level literature courses, and who must obtain a minimum grade of C to satisfy degree requirements in English major. Regular class meetings; weekly lectures, performances, or readings.

**Hours of Lecture or Seminar per week:** 6  
**Hours of Lab or Studio per week:** 0

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**ENGH 307 - English Grammar**

Credits: 3 (NR)
Overview of grammatical structure of English including word classes, phrases, and complex sentences. English grammar analyzed using modern syntactic theory. Students engage in language description through problem solving.

Equivalent to LING 307, ENGL 322 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ENGH 308 - Introduction to Literary Theory**

Credits: 3 (NR)
Introduces contemporary theories informing literary and cultural study such as deconstruction, poststructuralism, new historicism, feminism, psychoanalysis, and contemporary cultural studies.

Equivalent to ENGL 330 (2010-2011 Catalog)

**Prerequisite(s):** 6 credits of general education literature/humanities

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
**ENGH 309 - Topics in Literature**

Credits: 3 (RT)
Studies literature by topics, such as women in literature, science fiction, and literature of the avant garde.

Equivalent to ENGL 360 (2010-2011 Catalog), ENGL 363 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Notes:** Topic varies. May be repeated for credit when topic is different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ENGH 310 - Topics: Women and Literature**

Credits: 3 (RT)
Explores experiences of women as both authors and subjects of imaginative literature.

Equivalent to WMST 305, ENGL 369 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Notes:** May be repeated for a maximum of 6 credits when topic is different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ENGH 315 - Folklore and Folklife**

Credits: 3 (NR)
Topics include folktales, personal narratives, legends, proverbs, jokes, folk songs, folk art and craft, and folk architecture. Considers ethnicity, community, family, festival, folklore in literature, and oral history. Discusses traditions in students' own lives.

Equivalent to ENGL 333 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ENGH 316 - Topics in Myth and Literature**

Credits: 3 (RT)
Studies how traditional mythologies are reflected in English and American literature and other texts as themes, motifs, and
patterns.

Equivalent to ENGL 337 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 318 - Introduction to Cultural Studies

Credits: 3 (NR)
Introduces interpretive practices associated with cultural studies.

Equivalent to ENGL 327 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 319 - Popular Culture

Credits: 3 (NR)
Emphasizes popular fiction and adaptation of popular prose genres to media that have strong verbal and visual elements. Relationship between verbal and nonverbal elements of media such as film, comics, and radio.

Equivalent to ENGL 334 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 320 - Literature of the Middle Ages

Credits: 3 (NR)
Selected English narrative, dramatic, and homiletic literature written between 1300 and 1500, exclusive of Chaucer.

Equivalent to ENGL 400 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ENGH 321 - English Poetry and Prose of the 16th Century

Credits: 3 (NR)

Equivalent to ENGL 401 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 322 - Shakespeare

Credits: 3 (NR)
Survey of selected histories and comedies.

Equivalent to ENGL 335 (2010-2011 Catalog)

Prerequisite(s): 6 credits in literature

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 323 - Shakespeare

Credits: 3 (NR)
Survey of selected tragedies and romances.

Equivalent to ENGL 336 (2010-2011 Catalog)

Prerequisite(s): 6 credits in literature

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 324 - English Renaissance Drama

Credits: 3 (NR)
Major dramas and dramatists of English Renaissance, such as Lyly, Marlowe, Jonson, Middleton, Webster, and Ford.

Equivalent to ENGL 440 (2010-2011 Catalog)

Prerequisite(s): 6 credits in literature
ENGH 325 - English Poetry and Prose of the 17th Century

Credits: 3 (NR)
English poetry and prose from 1603 to 1688, excluding Milton.

Equivalent to ENGL 402 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

ENGH 330 - Augustan Age: 1660-1745

Credits: 3 (NR)
English literature from late 17th century to mid-18th century. Includes Dryden, Rochester, Behn, Defoe, Swift, Pope, and Montagu.

Equivalent to ENGL 404 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

ENGH 331 - Age of Sensibility: 1745-1800

Credits: 3 (NR)
English literature of later 18th century, time of American and French Revolutions, including new developments in novel, drama, biography, and poetry. Includes Johnson, Boswell, Blake, Goldsmith, Sterne, Gray, Cowper, Burney, Godwin, and Wollstonecraft.

Equivalent to ENGL 405 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

ENGH 332 - Restoration and 18th Century Drama
Credits: 3 (NR)
Restoration comedy of manners, sentimental comedy, and neoclassical and bourgeois tragedy. Theories of drama and conventions of staging. Includes writers such as Wycherley, Behn, Congreve, and Cowley.

Equivalent to ENGL 443 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 333 - British Novel of the 18th Century

Credits: 3 (NR)
English novel from its beginnings through turn of 19th century. Covers works by Behn, Defoe, Haywood, Richardson, Fielding, Sterne, Burney, Smollett, and Austen.

Equivalent to ENGL 450 (2010-2011 Catalog)

Prerequisite(s): 6 credits in literature

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 334 - British Poetry of the Romantic Period

Credits: 3 (NR)

Equivalent to ENGL 406 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 335 - Prose and Poetry of the Victorian Period

Credits: 3 (NR)
Poetry and nonfiction prose by such authors as Carlyle, Arnold, Tennyson, Elizabeth Barrett Browning, Robert Browning, Ruskin, Mill, and Wilde.

Equivalent to ENGL 407 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ENGH 336 - British Novel of the 19th Century

Credits: 3 (NR)
Works by Dickens, Thackeray, the Brontes, Eliot, Trollope, and Hardy.

Equivalent to ENGL 453 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 337 - British Poetry after 1900

Credits: 3 (NR)
Emphasizes Hardy, Yeats, Lawrence, Graves, Auden, Thomas, and Hughes. Fiction works employing poetic techniques, such as Joyce's Ulysses, may also be studied.

Equivalent to ENGL 462 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 338 - British Novel after 1900

Credits: 3 (NR)
Works by Conrad, Forster, Lawrence, Joyce, Woolf, Greene, Lessing, Spark, and Fowles.

Equivalent to ENGL 456 (2010-2011 Catalog)

Prerequisite(s): 6 credits in literature

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 339 - British and Irish Drama after 1900

Credits: 3 (NR)
English or Irish drama from Yeats to the present. Plays by authors such as Yeats, Synge, O'Casey, Osborne, Wesker, Pinter, Friel, Churchill, and Gems.

Equivalent to ENGL 445 (2010-2011 Catalog)
Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 340 - Early American Literature

Credits: 3 (NR)
Works of first 200 years of American literature, including Edwards, Franklin, Irving, Cooper, and Bryant.

Equivalent to ENGL 423 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 341 - Literature of the American Renaissance

Credits: 3 (NR)
Major writers of American Renaissance (1830-1865), with emphasis on Emerson, Thoreau, Hawthorne, Melville, Whitman, Poe, Stowe, Douglass, and Dickinson.

Equivalent to ENGL 425 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 343 - Development of the American Novel to 1914

Credits: 3 (NR)
Major American novels of the pre-World War I period with emphasis on Brown, Cooper, Hawthorne, Melville, Twain, Howells, James, Crane, Dreiser, Norris, and others.

Equivalent to ENGL 452 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 344 - Development of the American Novel since 1914
Credits: 3 (NR)
Works by Fitzgerald, Hemingway, Faulkner, Dos Passos, Wolfe, Bellow, and Nabokov.

Equivalent to ENGL 454 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 345 - American Drama of the 20th Century**

Credits: 3 (NR)
American drama of 20th century, with special attention to playwrights such as Glaspell, O'Neill, Miller, Williams, Fornes, and Albee.

Equivalent to ENGL 447 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 346 - American Poetry of the 20th Century**

Credits: 3 (NR)
Emphasizes work of Robinson, Frost, Stevens, Williams, Pound, Crane, Eliot, and Lowell. May include work of fiction employing poetic techniques, such as Faulkner's *The Sound and the Fury*.

Equivalent to ENGL 463 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 348 - Beginnings of African American Literature Through 1865**

Credits: 3 (NR)
Concentrating on such poets as Phillis Wheatley, Jupiter Hammon, Lucy Terry, and George Moses Horton, examines significant African American literary, social, and political texts produced through 1865. Special attention to narrative accounts of enslavement and freedom by Frederick Douglass, Harriet Jacobs, and Olaudah Equiano; political writings and orations of David Walker and Sojourner Truth; fiction of Harriet Wilson and William Wells Brown; and nonwritten cultural artifacts such as slave songs and spirituals.

Equivalent to ENGL 368 (2010-2011 Catalog)
ENGH 349 - African American Literature: Reconstruction to 1903

Credits: 3 (NR)

Equivalent to ENGL 370 (2010-2011 Catalog)

ENGH 350 - African American Literature Through 1946

Credits: 3 (NR)
Focusing on fiction, poetry, drama, and autobiography, explores the evolution of African American literature and aesthetics and major social, cultural, and historical movements such as the Harlem Renaissance of the 1920s and emergence of black naturalism, realism, and modernism in the 1930s-40s. Major authors include Zora Neale Hurston, Langston Hughes, Jessie Fauset, James Weldon Johnson, Jean Toomer, Nella Larsen, Margaret Walker, Chester Himes, Richard Wright, and Ann Petry.

Equivalent to ENGL 371 (2010-2011 Catalog)

ENGH 351 - Contemporary African American Literature

Credits: 3 (NR)
Encompassing an array of genres and forms, examines black writing from mid-20th century to present. Engages textual, critical, political, and theoretical issues related to cardinal literary movements, such as Black Arts Movement of 1960s and Third Renaissance of 1980s-90s. Examines how musical forms such as blues, jazz, and rap shaped literary production. Major authors include Ralph Ellison, Gwendolyn Brooks, James Baldwin, Lorraine Hansberry, Amiri Baraka, Alice Walker, Ernest Gaines, Gloria Naylor, August Wilson, and Toni Morrison.

Equivalent to ENGL 372 (2010-2011 Catalog)
Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 352 - Topics in Ethnic American Literature**

Credits: 3 (RT)
Studies particular ethnic American literatures. Focuses on literatures such as Asian American, Native American, Latino/a, Arab American, or Jewish American.

Equivalent to ENGL 352 (2010-2011 Catalog)

Prerequisite(s): 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic (expressed by course subtitle and content) is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

**ENGH 355 - Recent American Fiction**

Credits: 3 (NR)
American short story writers and novelists from World War II to present, including Mailer, Barth, Cheever, Oates, Gass, Beattie, Updike, and Morrison.

Equivalent to ENGL 355 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 356 - Recent American Poetry**

Credits: 3 (NR)

Equivalent to ENGL 390 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**ENGH 360 - Continental Fiction, 1770-1880**

Credits: 3 (NR)
Selected European novels in translation. Focuses on continental novel from 18th century to end of 19th century. Includes works of Balzac, Goethe, Gogol, Stendhal, Turgenev, Flaubert, Dostoievski, Tolstoy, and Chekhov.

Equivalent to ENGL 436 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ENGH 361 - Continental Fiction, 1880-1950**

Credits: 3 (NR)
Offered in cooperation with the Department of Modern and Classical Languages. Focuses on continental novel from beginning of 20th century to present. Includes Proust, Mann, Gide, Kafka, Yourcevar, Beauvoir, Calvino, and Garcia Marquez. Attention to influence of this literature on novel in English.

Equivalent to ENGL 437 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ENGH 362 - Global Voices**

Credits: 3 (RD)
Studies two cultures other than contemporary British or American culture through exploration of several textual forms such as written literature, oral literature, film, folklore, or popular culture. Specific cultures vary, but at least one is non-Western.

Fulfills general education requirement in global understanding.

Equivalent to ENGL 349 (2010-2011 Catalog)

**Prerequisite(s):** 45 credits.

**Notes:** May be repeated for credit when topic is different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ENGH 366 - The Idea of a World Literature**
Credits: 3 (NR)
Examines history and current status of conceptions of world literature, considering such topics as non-European influences on Western literature, shifting horizons of comparative literature, rise of postcolonial literature, place of translation, and role of international institutions such as UNESCO and the Nobel Prize. Focuses on degree to which these initiatives have been successful in promoting global understanding of literary production.

Fulfills general education requirement in global understanding.

Equivalent to ENGL 350 (2010-2011 Catalog)

Prerequisite(s): 45 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 367 - World Literatures in English

Credits: 3 (RT)
Study of selected topics, periods, genres, or authors in literature written in English, originating in Canada, Australia, New Zealand, South Asia, or Africa, for example.

Equivalent to ENGL 439 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 368 - Modern Drama

Credits: 3 (NR)
Representative plays of most influential European and American dramatists, with emphasis on dramatic styles such as realism, expressionism, epic, and existentialism. Studies Chekhov, Ibsen, Strindberg, Brecht, and Beckett.

Equivalent to ENGL 448 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 370 - Introduction to Documentary

Credits: 3 (NR)
Considers fundamental concepts of documentary form, style, and subject matter, ethical considerations, and theories of
documentary. Includes close analysis of a series of representative film and television texts.

Fulfills general education requirement in arts.

Equivalent to ENGL 331 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 372 - Introduction to Film

Credits: 3 (NR)  
Introduces film medium as an art form.

Fulfills general education requirement in arts.

Equivalent to ENGL 332 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 375 - Web Authoring and Design

Credits: 3 (NR)  
Provides a rhetorical foundation for web authoring and design in professional settings. Students will learn basic principles of writing for the web, information architecture, coding for accessibility, and usability testing. The production-oriented component of the course provides instruction in writing valid code and practice with web- and graphic-editing software tools.

Equivalent to ENGL 342 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 376 - Rhetoric and New Media

Credits: 3 (NR)  
Critical reading of new media texts and creation of technology-enriched texts in variety of rhetorical genres. Instructs students in rhetoric of new media, whether produced as hypertext, multimedia, or interactive digital productions. Technology-enriched activities present complex textuality of words, images, word-as-image, and kinetic text.

Equivalent to NCLC 343, ENGL 343 (2010-2011 Catalog)
Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 377 - Digital Creative Writing**

Credits: 3 (NR)
Combined workshop and studio course in technological and aesthetic issues of reading and writing hypermedia texts with emphasis on poetry, fiction, creative nonfiction, mixed genre, drama, or performance. Explores how genre meets hypertext and hypermedia in original creative work. Includes techniques in authoring interactive hypermedia projects using digital media tools.

Equivalent to ENGL 344 (2010-2011 Catalog)

Prerequisite(s): ENGL 396/ENGH 396 or permission of instructor.

Notes: May include reading assignments in hypertext and hypermedia theory.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 380 - Introduction to Writing and Rhetoric**

Credits: 3 (NR)
Introduces students to advanced strategies for writing academic, professional, and civic documents. Develops expository, persuasive, organizational, and stylistic skills through analysis of rhetorical situations and understanding of the features and approaches of successful writing. Students develop a significant informational or argumentative writing project related to their major field, profession, or area of interest.

Equivalent to ENGL 380 (2010-2011 Catalog)

Prerequisite(s): ENGL 302/ENGH 302 is recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 382 - Writing Nonfiction Genres**

Credits: 3 (NR)
Advanced practice in analyzing and writing nonfiction forms such as essay, profile, article, and technical or scientific report, depending on student's interests.

Equivalent to ENGL 382 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.
Notes: Not to be taken concurrently with ENGH 399 or 486, and not to be taken by students who have taken ENGH 486. Not a remedial course.

**ENGH 384 - Writing Ethnography**

Credits: 3 (NR)
Study and practice of ethnographic writing. Students conduct ethnographic investigations and practice journal keeping, field note recording, interviewing, transcription, and interpretation. Includes introduction to current issues in ethnographic writing.

Equivalent to ENGL 311 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

**ENGH 386 - Editing for Audience, Style, and Voice**

Credits: 3 (NR)
Introduces editing as a textual and rhetorical practice. Addresses copyediting, stylistics, and design; revisions based on audience, purpose, and genre; multimedia editing; interactions between editors and authors. (Not a remedial course in fixing sentence errors.)

Equivalent to ENGL 386 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

**ENGH 388 - Professional and Technical Writing**

Credits: 3 (NR)
Intensive study and practice in various forms of professional and technical writing, including proposals, reports, instructions, news releases, white papers, and correspondence. Emphasizes writing for variety of audiences, both lay and informed, and writing within various professional and organizational contexts.

Equivalent to ENGL 410 (2010-2011 Catalog)

Prerequisite(s): ENGL 302/ENGH 302.
**ENGH 396 - Introduction to Creative Writing**

Credits: 3 (NR)
Assignments include writing exercises and original works of poetry and fiction. May also include drama or creative nonfiction. Includes reading assignments in covered genres, and may include oral presentations or in-class performance. Original student work read and discussed in class and conference with instructor.

Fulfills general education requirement in arts.

Equivalent to ENGL 396 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 397 - Poetry Writing**

Credits: 3 (NR)
Workshop in reading, writing poetry. Original student work read and discussed in class and conferences with instructor. Technical exercises in craft of poetry; may include reading assignments.

Equivalent to ENGL 397 (2010-2011 Catalog)

Prerequisite(s): ENGL 396/ENGH 396 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 398 - Fiction Writing**

Credits: 3 (NR)
Workshop course in reading and writing fiction. Original student work read and discussed in class and conferences with instructor. Includes technical exercises in craft of fiction; may include reading assignments.

Equivalent to ENGL 398 (2010-2011 Catalog)

Prerequisite(s): ENGL 396/ENGH 396 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 399 - Creative Nonfiction Writing**
Workshop in reading and writing of nonfiction that makes use of literary techniques normally thought of in context of fiction, such as evoking senses and use of dialog. Original student work read and discussed in class and conferences with instructor. Includes technical exercises in artful creating of nonfiction; may include reading assignments.

Equivalent to ENGL 399 (2010-2011 Catalog)

**Prerequisite(s):** ENGL 309/ENGH 382 or ENGL 396/ENGH 396 or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 400 - Honors Seminar

Credits: 3 (RT)  
Emphasizes growth in awareness of literary scholarship as a discipline, providing opportunity for advanced study in literary and cultural criticism. Covers variety of topics, including consideration of a literary period, genre, author, work, theme, discourse, or critical theory.

Equivalent to ENGL 414 (2010-2011 Catalog)

**Prerequisite(s):** Permission of department. Only open to English department honors students.

**Notes:** May be repeated for a maximum of 6 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 401 - Honors Thesis Writing Seminar

Credits: 3 (NR)  
Provides guidance in research methods to students writing an honor thesis as well as workshop for critiquing works in progress. May be taken concurrently with another approved course offered by English Department, in which case thesis work may substitute for some assigned work in second course by arrangement of both instructors.

Equivalent to ENGL 401 (2010-2011 Catalog)

**Prerequisite(s):** Acceptance into English honors; permission of department and ENGL 414/ENGH 400 or ENGL 416/ENGH 402.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 402 - Honors Independent Study
Credits: 1-3 (NR)
Intensive writing course. Honors students concentrating in nonfiction writing and editing may use English 416 to replace English 414 as first course in honors program.

Equivalent to ENGL 416 (2010-2011 Catalog)

Prerequisite(s): Admission to honors program in English, and permission of instructor

Notes: Honors students concentrating in creative writing may use English 402 to replace 401 as second course in honors program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-12

ENGH 408 - Topics in Criticism

Credits: 3 (RT)
Studies selected approach to literary criticism, as announced, with exercises in critical analysis. Includes new criticism, structuralism, psychoanalysis, and Marxism.

Equivalent to ENGL 494 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 409 - Literary Modes

Credits: 3 (RT)
Theory and practice of such modes as tragedy, comedy, tragicomedy, romance, and satire, considered in separate semesters and drawn from variety of periods ranging from biblical times to present, with examples from drama, poetry, and fiction.

Equivalent to ENGL 495 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 12 credits with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 412 - Topics in Folklore Studies
ENGH 414 - Folklore of the Spirit World

Credits: 3 (NR)
Examines traditional narratives and beliefs about otherworldly experiences and beings. Introduces traditional narrative theory and discusses how people construct and tell their stories about encounters with the supernatural. Considers the conflicts, worldviews, and competing values these stories bring into material form. Focuses on traditions from around the world as well as on personal experiences of students.

Equivalent to ENGL 480 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 415 - Folk Arts and Folk Artists

Credits: 3 (NR)
Examines the traditional arts of everyday life, such as festive foods, mementos and other objects of memory, textile arts, pottery, carving in wood and stone, roadside shrines, and more. Explores the folk aesthetics of group-based creativity through the lenses of biography, history, literature, and folklore studies. Considers traditional objects as narratives in material form. Examples drawn from multiple cultures as well as traditions in students' own lives.

Equivalent to ENGL 481 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 416 - Ethnicity and Migration in Folklore

Credits: 3 (NR)
Explores U.S. immigration trends and the historical basis for the concepts of ethnicity, identity, and immigration in folklore scholarship, literature, film, and popular media. The course explores at least three of the following ethnic groups: Latino, Asian,
Jewish, European, Arab, or African.

Equivalent to ENGL 479 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 418 - Cultural Constructions of Sexualities**

Credits: 3 (NR)
Introductory survey of cultural, literary, and theoretical constructions of sexuality that seek to complicate traditionally fixed categories of identity. Examines various representations of human sexuality, with particular attention to intersections with gender, race, ethnicity, nationality, and class.

Equivalent to WMST 302, ENGL 338 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 419 - Topics in Popular Literature**

Credits: 3 (RT)
Studies specific topic or theme in popular literature.

Equivalent to ENGL 493 (2010-2011 Catalog)

Prerequisite(s): 6 credits in literature.

Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 421 - Medieval Literature in Context**

Credits: 3 (NR)
Examines selected topic in intellectual history of Middle Ages.

Equivalent to HIST 431/FRLN 431 and ENGL 431 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be taken for credit by English or history majors. Specific topic may vary. Primary emphasis is literary or historical,
depending on discipline of instructor. May consider relevant material from philosophy, theology, and art.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 422 - Chaucer**

Credits: 3 (NR)
Major works of Chaucer, with emphasis on *The Canterbury Tales*.

Equivalent to ENGL 471 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 424 - Spenser**

Credits: 3 (NR)
Poetry of Edmund Spenser, with central emphasis on *The Faerie Queene*.

Equivalent to ENGL 472 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 426 - Studies in Shakespeare**

Credits: 3 (RT)
Study of one aspect of Shakespeare's art or critical issues surrounding his work.

Equivalent to ENGL 473 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 428 - Milton**
Milton's major poetic works, with emphasis on *Paradise Lost*.

Equivalent to ENGL 474 (2010-2011 Catalog)

**Prerequisite(s)**: 3 credits of 100-level English and 3 credits of general education literature.

**Hours of Lecture or Seminar per week**: 3  
**Hours of Lab or Studio per week**: 0

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**ENGH 431 - Topics: British Literary Periods**

Credits: 3 (RT)  
In-depth study of selected period of British literature. In addition to literary examples, materials may be chosen from art, philosophy, or popular culture of the time.

Equivalent to ENGL 408 (2010-2011 Catalog)

**Prerequisite(s)**: 3 credits of 100-level English and 3 credits of general education literature.

**Notes**: May be repeated for a maximum of 6 credits when topic is different with permission of department.

**Hours of Lecture or Seminar per week**: 3  
**Hours of Lab or Studio per week**: 0

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**ENGH 432 - Topics: British Authors**

Credits: 3 (RT)  
Study of one or two major figures in British literature.

Equivalent to ENGL 477 (2010-2011 Catalog)

**Prerequisite(s)**: 3 credits of 100-level English and 3 credits of general education literature.

**Notes**: May be repeated for a maximum of 12 credits when topic is different with permission of department.

**Hours of Lecture or Seminar per week**: 3  
**Hours of Lab or Studio per week**: 0

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**ENGH 441 - Topics: American Authors**

Credits: 3 (RT)  
Study of one or two major figures in American literature.

Equivalent to ENGL 478 (2010-2011 Catalog)

**Prerequisite(s)**: 3 credits of 100-level English and 3 credits of general education literature.
Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 442 - Topics: American Literary Periods

Credits: 3 (RT)
In-depth study of selected period of American literature. In addition to literary examples, materials may be chosen from art, philosophy, or popular culture of time.

Equivalent to ENGL 429 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 451 - Science Fiction

Credits: 3 (NR)
Major works of science fiction in terms of mode, themes, and narrative techniques, especially role of hypothesis in science fiction. Focuses on novels, short stories from early 19th century to present.

Equivalent to ENGL 492 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 452 - Critical Study of Children's Literature

Credits: 3 (NR)
Examines the history and criticism of children's literature and the strategies used by authors of children's literature to address their audience. Selected readings range from Puritan to contemporary writing for children, as well as influential works in educational philosophy, such as those by Locke and Rousseau.

Equivalent to ENGL 460 (2010-2011 Catalog)

Prerequisite(s): 3 credits 100-level English and 3 credits general education literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**ENGH 453 - Topics in Fiction**

Credits: 3 (RT)
Study of selected topics, periods, or authors.

Equivalent to ENGL 459 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Notes:** May be repeated for a maximum of 6 credits when topic is different with permission of department.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**ENGH 454 - Topics in Poetry**

Credits: 3 (RT)
Study of selected topics, periods, or poets.

Equivalent to ENGL 468 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Notes:** May be repeated for a maximum of 6 credits when topic is different with permission of department.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**ENGH 455 - Topics in Drama**

Credits: 3 (RT)
Studies selected topics, periods, or playwrights.

Equivalent to ENGL 449 (2010-2011 Catalog)

**Prerequisite(s):** 3 credits of 100-level English and 3 credits of general education literature.

**Notes:** May be repeated for a maximum of 6 credits when topic is different with permission of department.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**ENGH 456 - Topics in Literary Nonfiction**
Credits: 3 (RD)
Special studies in literary nonfiction by topic, such as the personal essay, New Journalism, the "nonfiction novel," the memoir, or historical traditions of literary nonfiction.

Equivalent to ENGL 385 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 459 - Internship

Credits: 1-3 (RT)
Under supervision of a faculty director, students report and reflect on their work as interns at organizations of their choosing, usually in writing and/or editing positions. For 3 credits, students work on site at least 135 hours as specified in the agreement developed with the internship supervisor and approved by the faculty director.

Equivalent to ENGL 498 (2010-2011 Catalog)

Prerequisite(s): Permission of internship director. 60 credits. English majors need 18 credits of English (3 credits of 100-level English course; 3-6 credits of 200-level English courses; 3 credits of ENGL 302/ENGH 302, and 6-9 credits of upper-level English courses). Non-English majors must meet the same requirements, except that they replace one upper-level English course with an upper-level course in their major.

Notes: Contact the English Department one semester prior to enrollment. No more than 3 credits can be counted in concentration or English minor. May be repeated for a total of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-9
When Offered: Fall, Spring

ENGH 470 - Topics in Film/Media History

Credits: 3 (RT)
Advanced studies of development of film language, both as cultural practice and medium for formal innovation. Topics might include studies of national cinemas, historical periods, genres, or individual directors.

Equivalent to ENGL 421 (2010-2011 Catalog)

Prerequisite(s): ENGL 332/ENGH 372 or permission of instructor

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ENGH 472 - Topics in Film/Media Theory

Credits: 3 (RT)
Advanced studies of theories about various aspects of production, distribution, and reception of film-mediated experiences. Topics may include theories of spectator, semiotics, feminist film theory, theories of narrativity, structuralist film theory, or deconstruction.

Equivalent to ENGL 422 (2010-2011 Catalog)

Prerequisite(s): ENGL 332/ENGH 372 or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 474 - Topics in Film/Media Studies

Credits: 3 (RT)
American and foreign films selected by type, period, or director with emphasis varying from year to year. Required viewings, student discussion, and written critiques.

Equivalent to ENGL 490 (2010-2011 Catalog)

Prerequisite(s): ENGL 332/ENGH 372 or permission of instructor.

Notes: May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 486 - Writing Nonfiction for Publication

Credits: 3 (NR)
Workshop course. Intensive practice in advanced nonfiction writing; emphasizes writing for publication. Occasional special topics sections in such forms as autobiography and scientific writing.

Equivalent to ENGL 489 (2010-2011 Catalog)

Prerequisite(s): ENGL 309/ENGH 382 or ENGL 399/ENGH 399 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ENGH 488 - Topics in Writing and Rhetoric

Credits: 3 (RD)
Advanced studies in rhetoric and writing. Introduces key rhetorical terminology and examines how texts construct meaning and how those meanings are determined within social contexts. Topics may include the relationship between rhetorics and poetics, rhetoric and new media, histories of rhetoric, global rhetorics, argument theory, discourse analysis, theories of technical communication, or advanced theories of composition and pedagogy.

Equivalent to ENGL 496 (2010-2011 Catalog)

Prerequisite(s): 3 credits of 100-level English and 3 credits of general education literature.

Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 492 - Advanced Fiction Writing Workshop

Credits: 3 (RD)
Workshop; intensive practice in creative writing and study of creative process. Intended for students already writing original creative work.

Equivalent to ENGL 458 (2010-2011 Catalog)

Prerequisite(s): ENGL 398/ENGH 398 and manuscript review.

Notes: Enrollment is controlled. Submit 8-10 pages of fiction to instructor for review. May be repeated for a maximum of 6 credits with permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 494 - Advanced Poetry Writing Workshop

Credits: 3 (RD)
Intensive practice in the craft of poetry and study of the imagination in creative process. Intended for students already writing original poetry.

Equivalent to ENGL 464 (2010-2011 Catalog)

Prerequisite(s): ENGL 397/ENGH 397 and manuscript review.

Notes: Enrollment is controlled. Submit 8-10 pages of poetry to instructor for review. May be repeated for a maximum of 6 credits with permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ENGH 497 - Topics in Creative Writing

Credits: 3 (RT)
Intensive practice in creative writing and study of creative process. Workshop course. Concentrates on specialized literary type other than short story or poetry such as playwriting, screenwriting, children's literature, travel literature, autobiography, gothic novel, or translation.

Equivalent to ENGL 497 (2010-2011 Catalog)

Prerequisite(s): ENGL 396/ENGH 396 or equivalent and permission of instructor.

Notes: For students already writing original creative work. Students must submit typed manuscript at least one week before registration. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 499 - Independent Study

Credits: 1-6 (RT)
Intensive study of particular author, genre, period, or critical or theoretical problem in literature or linguistics, to be conducted by student in close consultation with instructor. Student produces at least one substantial piece of written work during semester on research findings.

Equivalent to ENGL 499 (2010-2011 Catalog)

Prerequisite(s): Permission of department and instructor.

Notes: Individualized section form required. May be repeated for a maximum of 6 credits with approval of department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

ENGH 501 - Introduction to Professional Writing and Rhetoric

Credits: 3 (NR)
Provides historical and theoretical background in professional writing and editing in a seminar format. Explores professional writing's emergence as a field of scholarship and practice, emphasizes the relationships between rhetorical theories and practice, and introduces students to bibliographic research in the field.

Equivalent to ENGL 501 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**ENGH 502 - Research Methods in Rhetoric and Professional Writing**

Credits: 3 (NR)
Introduces theory, methods, and ethics of conducting research in rhetoric and professional writing. Students learn to conduct and evaluate research that may include rhetorical analysis, discourse analysis, historical methods, ethnography, user-centered design, document and usability testing, and others.

Equivalent to ENGL 502 (2010-2011 Catalog)

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ENGH 503 - Theory and Practice of Editing**

Credits: 3 (NR)
Instruction in revising, editing, and preparing specialized writing for printing. Emphasizes methods of achieving clarity, accuracy, and completeness. Lecture and discussion on editing and printing techniques; practical exercise in revision, layout, and production.

Equivalent to ENGL 503 (2010-2011 Catalog)

**Prerequisite(s):** 6 credits of English courses numbered above 300, including one of 382, 384, 396, 397, 398, 388, 492, 494, 486, or 497; or permission of department.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ENGH 504 - Internship**

Credits: 1-6 (RD)
Under supervision of a faculty director, students report and reflect on their work as interns at organizations of their choosing, usually in writing and/or editing positions. For 3 credits, students work on site at least 135 hours as specified in the agreement developed with the internship supervisor and approved by the faculty director.

Equivalent to ENGL 504 (2010-2011 Catalog)

**Prerequisite(s):** Permission of internship director.

**Notes:** Contact the English Department one semester prior to enrollment. May be repeated for a maximum of 6 credits.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**ENGH 505 - Document Design**
Credits: 3 (NR)
Theory and practice of using computer programs to design and produce publications including brochures, fliers, newsletters, and small magazines. Includes readings, writing papers, and producing and editing copies and original publications.

Equivalent to ENGL 505 (2010-2011 Catalog)

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### ENGH 506 - Research for Narrative Writing

Credits: 3 (NR)
Combines study of basic research tools with field work and writing workshop experience. Helps students develop techniques and skills necessary for writing a research-dependent project of sufficient complexity to be of book or long essay length. Emphasis on finding story behind facts, using material from numerous sources.

Equivalent to ENGL 506 (2010-2011 Catalog)

**Prerequisite(s):** ENGL 565/ENGH 565 or ENGL 566/ENGH 566, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### ENGH 507 - Web Authoring and Design

Credits: 3 (NR)
Provides a rhetorical foundation for web authoring and design in professional settings. Teaches basic principles of writing for the web, information architecture, coding for accessibility, and usability testing. Production-oriented component provides instruction in writing valid code and practice with web- and graphic-editing software tools.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### ENGH 508 - Digital Rhetoric

Credits: 3 (NR)
Provides an examination of major works on digital rhetoric and digital media framed by contemporary rhetorical theories that inform the emergent field of digital rhetoric. Course work includes projects that engage in the design, analysis, and assessment of digital media.

Equivalent to ENGL 508 (2010-2011 Catalog)

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
ENGH 511 - Styles and Modes in Literary History

Credits: 3 (NR)
Historical consideration of principal styles, modes, and intellectual paradigms in literary and cultural texts.

Equivalent to ENGL 511 (2010-2011 Catalog)

Prerequisite(s): 15 credits of advanced undergraduate work and approval of the department.

Notes: Baccalaureate degree highly recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 512 - Issues in Literature and Philosophy

Credits: 3 (NR)
Interdisciplinary seminar offering opportunity to arrive at a personal synthesis of work previously done in philosophy and literature. Topic changes yearly, but focuses on themes or methodologies common to both disciplines.

Equivalent to ENGL 512 (2010-2011 Catalog)

Prerequisite(s): Graduate or senior standing, 6 credits of upper-level English, 6 credits of philosophy, and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

ENGH 513 - Advanced Special Topics in English

Credits: 3 (RT)
Intensive study of topics involving literary or other texts such as film, television, opera, and folklore.

Equivalent to ENGL 513 (2010-2011 Catalog)

Prerequisite(s): 15 credits of advanced undergraduate English courses and permission of department; or baccalaureate degree.

Notes: May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 514 - Theories of Comparative Literature

Credits: 3 (NR)
Intensive study of major theories of comparative literature with special emphasis on development and redefinition of comparative
outlook, from Great Books and Western Canon to transnationalism, multiculturalism, and intercultural studies.

Equivalent to CL 514

Prerequisite(s): CL 300 and senior standing, or baccalaureate degree; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 526 - Special Topics in the History and Criticism of Children's Literature**

Credits: 3 (RD)
Focuses on the history and criticism of children's literature by concentrating on selected historical periods and literary modes such as "Golden Age" children's literature, contemporary fantastic and children's literature, or Romantic and Victorian children's literature.

Equivalent to ENGL 526 (2010-2011 Catalog)

Notes: May be repeated for a maximum of 6 credits with permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 551 - Literary Criticism**

Credits: 3 (NR)
Studies in selected critical theories pertinent to textual and cultural analysis.

Equivalent to ENGL 551 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 555 - Introduction to Cinema Studies**

Credits: 3 (NR)
Advanced introduction to film study, including overview of approaches to study of cinema, methods of close analysis, basic concepts of film form and style, and contemporary theories of film.

Equivalent to ENGH 372 and ENGL 332 (2010-2011 catalog)

Notes: Students who have taken ENGL 332/ENGH 372 may not take this course for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ENGH 564 - Form of Poetry

Credits: 3 (NR)
Students seeking permission must submit typed manuscript of original poetry. Intensive study of and practice in formal elements of poetry through analyzing models and weekly or biweekly writing assignments. Intended for students already writing original poetry. Covers rhyme, meter, rhythm, lineation, stanza pattern, traditional and experimental forms, free verse and open-form composition, lyric, narrative, and dramatic modes.

Equivalent to ENGL 564 (2010-2011 Catalog)

Prerequisite(s): Admission to MFA concentration in poetry; ENGL 464/ENGH 494 or equivalent, or permission of instructor.

Notes: Other interested students should contact the English Department at (703) 993-1180.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 565 - Forms of Nonfiction

Credits: 3 (NR)
Intensive study of and practice in various forms of nonfiction writing through analyzing models and weekly writing assignments. Includes biographies, documentaries, editorials, interviews, reports, reviews, and essays.

Equivalent to ENGL 565 (2010-2011 Catalog)

Prerequisite(s): Admission to MFA concentration in nonfiction; ENGL 489/ENGH 486 or equivalent, or permission of instructor.

Notes: Other interested graduate students should contact the English Department at (703) 993-2763.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 566 - Forms of Fiction

Credits: 3 (NR)
Students seeking permission must submit typed manuscript of original fiction. Intensive practice in formal elements of fiction through analyzing models and weekly or biweekly writing assignments. Intended for students already writing original fiction. Covers description, narration, plot, dialogue, voice, point of view, style, epiphany, and antifiction techniques.

Equivalent to ENGL 566 (2010-2011 Catalog)

Prerequisite(s): Admission to MFA concentration in fiction; ENGL 458/ENGH 492 or equivalent or permission of instructor.

Notes: Other interested graduate students should contact the English Department at (703) 993-1180.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**ENGH 590 - Topics in Folk Narrative**

Credits: 3 (RD)  
Explores types of folk narratives such as mythology, folktale, fairy tale, legend, family narrative, personal narrative. Focuses on tales from around the world. Considers aspects of storytelling such as storytelling as performance, storytelling as therapeutic modality, and storytelling during crises and conflicts.

Equivalent to ENGL 590 (2010-2011 Catalog)

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ENGH 591 - Topics in Folklore Studies**

Credits: 3 (RT)  
Explores folklore and folklife topics such as folk narrative and story telling, folklore and literature, folksong, and folk arts.

Equivalent to ENGL 591 (2010-2011 Catalog)

Notes: May be repeated for a maximum of 12 credits when topic is different.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ENGH 592 - Historical Studies of the English Language**

Credits: 3 (NR)  
Either a chronological survey of development of English from Old and Middle English to Modern English and American English; or intensive study of grammar and syntax of Old English as literary language in representative texts of period.

Equivalent to ENGL 592 (2010-2011 Catalog)

Notes: May be repeated for credit with permission of department.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ENGH 604 - Internship in Folklore**

Credits: 1-6 (NR)  
Unpaid, approved work-study positions at specific sites arranged by interested students and their advisor. Under supervision of faculty advisor, student works as intern with site supervisor in agency of student's choosing, given advisor's permission.
Equivalent to ENGL 604 (2010-2011 Catalog)

**Prerequisite(s):** A course in folklore, which may be taken concurrently.

**Notes:** For 3 credits, students work 120 hours on site and write 3,500 words, or equivalent, given contract with advisor. Contact English Department one semester prior to enrollment.

**Hours of Lecture or Seminar per week:** 1-12  
**Hours of Lab or Studio per week:** 0

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**ENGH 608 - Craft Seminars**

Credits: 3 (RT)  
Non-MFA students seeking permission must submit manuscript of original written work in appropriate genre. Various sections offer work in fiction, poetry, and nonfiction, each focusing in different ways on the practices and the craft development of writers. Numerous writing assignments mixed with reading followed by careful analytical and craft discussions.

Equivalent to ENGL 608 (2010-2011 Catalog)

**Prerequisite(s):** Admission to MFA program or ENGL 464/ENGH 494, ENGL 458/492, ENGL 489/486, or permission of instructor. Non-MFA students must submit manuscript for review prior to registration.

**Notes:** Assignments vary with genre and specific topic. May be taken concurrently with ENGH 564, 565, 566.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ENGH 610 - Proseminar in Teaching the Reading of Literature**

Credits: 3 (NR)  
Methods of teaching literature. Includes study of methods of literary analysis, and ways of developing student responses to literature, with some classroom practice.

Equivalent to ENGL 610 (2010-2011 Catalog)

**Notes:** Does not satisfy Virginia certification requirement in diagnostic or developmental reading.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ENGH 611 - Studies in Rhetoric**

Credits: 3 (NR)  
Reading and discussion of several major texts that address patterns of discourse, communication, and other issues of rhetoric.

Equivalent to ENGL 611 (2010-2011 Catalog)
Notes: Content varies. Recent offerings include 20th century rhetoric, collaborative writing, and computers and rhetoric. May be repeated for credit with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 612 - Cultures of Professional Writing

Credits: 3 (NR)
Students work as ethnographers, studying selected sites where people write professionally, and analyzing ways production and reception of writing contribute to and result from local culture of each site. Lecture and workshop format.

Equivalent to ENGL 612 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 613 - Technical Communication

Credits: 3 (NR)
Intensive study of theory and practice of technical and scientific writing, with emphasis on writing for variety of audiences. Focuses on writing and evaluating formal reports, articles for lay and technical audiences, proposals, theses, manuals, and other forms of technical prose.

Equivalent to ENGL 613 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 614 - Internship in the Teaching of Writing

Credits: 1-3 (NR)
Internships provide experience working in a teaching program such as school or writing center. Under direction of faculty member, students must secure cooperation of on-site supervisor.

Equivalent to ENGL 614 (2010-2011 Catalog)

Notes: Students work minimum 3 hours per week per credit to be awarded, keep a weekly reflective and analytical log, and communicate regularly with faculty director. May not be repeated for credit.

Hours of Lecture or Seminar per week: 1-5
Hours of Lab or Studio per week: 0

ENGH 615 - Proseminar in Composition Instruction

George Mason University 2012-2013 Official University Catalog 2253
Methods of teaching expository writing. Includes consideration of planning courses, practice in teaching and grading papers, and study of recent developments in teaching writing.

Equivalent to ENGL 615 (2010-2011 Catalog)

ENH 616 - Nonfiction Writing Workshop

Credits: 1-6 (RD)
Intensive practice in craft of nonfiction and study of creative process. Intended for students already familiar with traditional and contemporary nonfiction, and already writing original nonfiction.

Equivalent to ENGL 616 (2010-2011 Catalog)

Prerequisite(s): ENGL 565/ENGH 565, which may be taken concurrently, and permission of instructor, except for MFA students in concentration.

Notes: At discretion of instructor, reading may be required. May be repeated for credit with permission of department.

ENH 617 - Poetry Writing Workshop

Credits: 1-6 (RD)
Intensive practice in craft of poetry and study of creative process. Intended for students already familiar with traditional and contemporary poetic modes and already writing original poetry.

Equivalent to ENGL 617 (2010-2011 Catalog)

Prerequisite(s): ENGL 564/ENGH 564, which may be taken concurrently, and permission of instructor, except for MFA students in concentration.

Notes: At discretion of instructor, reading may be required. May be repeated for credit with permission of department.

ENH 618 - Fiction Writing Workshop

Credits: 1-6 (RD)
Intensive practice in craft of fiction and study of creative process. Intended for students already familiar with traditional and contemporary fiction and already writing original fiction.
ENH 618

Equivalent to ENGL 618 (2010-2011 Catalog)

Prerequisite(s): Admission to MFA concentration in fiction or ENGL 566/ENGH 566, which may be taken concurrently, or permission of instructor. Other interested graduate students should contact the English Department at (703) 993-1180.

Notes: At discretion of instructor, reading may be required. May be repeated for credit with permission of department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

ENH 619 - Special Topics in Writing

Credits: 3 (RT)
Workshop course. Intensive practice in creative writing and study of creative process. Concentrates on specialized literary type other than short story, such as essay, playwriting, film writing, children's literature, travel literature, autobiography, gothic novel, and translation.

Equivalent to ENGL 619 (2010-2011 Catalog)

Prerequisite(s): Admission to MFA program.

Notes: Intended for students already writing original creative work. Other interested graduate students should contact the English department at (703) 993-1180. May be repeated for credit with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENH 625 - British Medieval

Credits: 3 (RD)
Selected literary authors, works, or movements from 1300 to 1500, studied in Middle English.

Equivalent to ENGL 625 (2010-2011 Catalog)

Notes: Topics vary. May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENH 630 - Early Modern

Credits: 3 (RT)
Selected literary authors, works, or movements of English Renaissance.

Equivalent to ENGL 630 (2010-2011 Catalog)

Notes: Topics vary. May be repeated for a maximum of 9 credits with permission of department.
ENGH 635 - Eighteenth-Century British

Credits: 3 (RD)
Selected English literary authors, works, or movements of the 18th century.

Equivalent to ENGL 635 (2010-2011 Catalog)

Notes: Topic varies. May be repeated for a maximum of 6 credits when topic is different with permission of department.

ENGH 640 - Nineteenth-Century British

Credits: 3 (RD)
Selected English literary authors, works, or movements of the 19th century.

Equivalent to ENGL 640 (2010-2011 Catalog)

Notes: Topics vary. May be repeated for a maximum of 6 credits when topic is different with permission of department.

ENGH 645 - Twentieth-Century British

Credits: 3 (RD)
Selected English literary authors, works, or movements of the 20th century.

Equivalent to ENGL 645 (2010-2011 Catalog)

Notes: Topics vary. May be repeated for a maximum of 6 credits when topic is different with permission of department.

ENGH 650 - Seventeenth-Century American

Credits: 3 (RD)
Selected literary authors, works, or movements of the "new world" before 1800.
ENGH 655 - Nineteenth-Century American

Credits: 3 (RD)
Selected American literary authors, works, or movements of the 19th century.

Equivalent to ENGL 655 (2010-2011 Catalog)

Notes: Topics vary. May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 660 - Twentieth-Century American

Credits: 3 (RT)
Selected American literary authors, works, or movements of the 20th century.

Equivalent to ENGL 660 (2010-2011 Catalog)

Notes: Topics vary. May be repeated for credit when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 661 - Advanced Survey in African American Literature

Credits: 3 (RD)
Intensive study of a period in African-American literature between 1800 and present with focus to be determined by instructor. Considers different genres including autobiography, fiction, drama, poetry, essays, and oral artifacts such as slave songs, spirituals, and hip-hop.

Equivalent to ENGL 661 (2010-2011 Catalog)

Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**ENGH 665 - Texts in Global Contexts**

Credits: 3 (RT)
Examines various cultural texts such as literature, drama, film, and folklore in terms of transnational circulation or production and reception in locations around the world other than Britain and United States. Engages with issues arising from globalization of English and interplay of global cultures.

Equivalent to ENGL 665 (2010-2011 Catalog)

Notes: Texts studied in English or English translation. May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 670 - Visual Culture: Theories and Histories**

Credits: 3 (RT)
Advanced study in histories of visual representation including film, television, and video, and in theories of production and circulation of meanings in visual culture.

Equivalent to ENGL 670 (2010-2011 Catalog)

Prerequisite(s): Introductory film course, or permission of instructor.

Notes: May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 675 - Feminist Theory and Criticism**

Credits: 3 (NR)
Presents historically based introduction to major debates within feminist theory and criticism. Stressing gender in literature and its interpretation, explores diverse collection of feminist interpretive practices.

Equivalent to ENGL 675 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 676 - Introduction to Cultural Studies**

Credits: 3 (NR)
Advanced introduction to theoretical practice known as cultural studies, with attention to role in textual studies. Part of interdisciplinary cultural studies PhD and MA in English programs.
Equivalent to ENGL 676 (2010-2011 Catalog)

**ENGH 681 - Advanced Topics in Folklore Studies**

Credits: 3 (RD)
Explores advanced folklore and folklife topics such as bodylore, sense of place, festival, folk drama, and folk narrative studies.

Equivalent to ENGL 681 (2010-2011 Catalog)

**Notes:** May be repeated for a maximum of 12 credits when topic is different.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall, Spring

**ENGH 684 - Proseminar in Poetry**

Credits: 3 (RD)
For students working on independent reading and research in poetry. Designed for students preparing to take the MFA reading exam in poetry but open to others with comparable reading projects in poetry.

Equivalent to ENGL 684 (2010-2011 Catalog)

**Notes:** May be repeated for a maximum of 6 credits.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**Grading:** Satisfactory/No credit only

**ENGH 685 - Selected Topics, Movements, or Genres of Literature in English**

Credits: 3 (RT)
Content varies.

Equivalent to ENGL 685 (2010-2011 Catalog)

**Notes:** May be repeated for a maximum of 12 credits with permission of department.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**ENGH 695 - Northern Virginia Writing Project Inservice Program**

Credits: 1-3 (RT)
Offered at request of school division or other education agency to assist teachers in improving student writing and use of writing to learn.

Equivalent to EDUC 695; ENGL 695 (2010-2011 Catalog)

**Prerequisite(s):** Admission to graduate program, or permission of department.

**Notes:** Content varies. May be repeated for credit with permission of department.

**Hours of Lecture or Seminar per week:** 1-5
**Hours of Lab or Studio per week:** 0

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**ENGH 696 - Northern Virginia Writing Project Teacher/Research Seminar**

Credits: 3 (NR)
Acquaints classroom teachers with current research on composing as well as methods of studying writing in school settings. Participants collect data and write up results of their research.

Equivalent to ENGL 696 (2010-2011 Catalog)

**Prerequisite(s):** ENGL 615/ENGH 615, ENGL 695/ENGH 695, the Northern Virginia Writing Project Summer Institute, or other course in the teaching of writing.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**ENGH 697 - Composition Theory**

Credits: 3 (NR)
Acquaints classroom teachers with theory relating to writing and teaching composition. Focuses on explaining theories of participants, reading works of leading theorists, and developing statement describing implications of theoretical consistency in teaching writing.

Equivalent to EDUC 697 and ENGL 697 (2010-2011 Catalog)

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**ENGH 699 - Workshop in English**

Credits: 1-3 (RT)
Concentrated workshops, educational tours, independent studies, and special seminars dealing with selected topics in writing, linguistics, film, electronic media, and literature written in English.
Equivalent to ENGL 699 (2010-2011 Catalog)

Prerequisite(s): Admission to MFA program or permission of department.

Notes: All tours are optional, and may be replaced by specified work conducted on campus. May be repeated for a maximum of 12 credits with permission of department, but no more than 6 credits of ENGH 699 may be applied to master's degree in English. No more than 3 credits of 699 may be applied to literature requirement for MFA degree.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

ENGH 701 - Research in English Studies

Credits: 3 (NR)
Introduces research in English studies, including practice in library methods, writing critical bibliography, evaluating issues and problems, and surveying scholarly activities in department.

Equivalent to ENGL 701 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 702 - Research Methods in Rhetoric and Writing

Credits: 3 (NR)
Explores a variety of text-based and empirical approaches and methods for addressing questions and problems related to public rhetoric and writing programs. Seminar participants work through a complete research design and pilot study.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 705 - Literary Theory and Criticism

Credits: 3 (RD)
Major theories of literature and methods of analyzing and evaluating literary works.

Equivalent to ENGL 705 (2010-2011 Catalog)

Notes: Topics vary. May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ENGH 720 - Histories of Institutional Rhetorics
Credits: 3 (NR)
Examines the development of rhetorics within their historical and institutional contexts. Investigates rhetoric and rhetoricians across the development of oral rhetorics and the shift to written genres, the rise of scientific discourses, and the establishment of educational and bureaucratic organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 722 - Composition Pedagogies and Programs in Context**

Credits: 3 (NR)
Examines scholarship on pedagogy, curriculum design and assessment, faculty development, and program management related to the practice of teaching or training writers in an institutional setting: two- and four-year colleges, K-12 schools, and workplace training seminars. Students will complete independent projects analyzing a current or potential writing program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 724 - Professional Writing Theory and Research**

Credits: 3 (NR)
Examines current research in the field and the theories that inform it. Special emphasis is placed on workplace contexts and users in technological contexts. Course may include theories and methods such as activity theory, actor-network theory, complexity theory, cross-cultural rhetoric, digital rhetoric, discourse analysis, ethnography, genre theory, usability, and systems theory.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 726 - Rhetorical Theory and Public Spaces**

Credits: 3 (NR)
Covers the major theories of public rhetoric and the public sphere; explores how rhetoric influences public perceptions; examines publics as a site of interpretive mediation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 740 - Seminar in English/Cultural Studies**

Credits: 3 (RD)
Analyzes historical shifts in literary and cultural discourse or of relationships between literary and nonliterary elements of culture within specific historical moment.

Equivalent to ENGL 740 (2010-2011 Catalog)
**Prerequisite(s):** 9 credits of graduate English courses including ENGL 701/ENGH 701, or permission of department.

**Notes:** Major research paper required. Topics vary. May be repeated for a maximum of 6 credits when topic is different with permission of department.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ENGH 750 - Advanced Workshop in Poetry Writing**

Credits: 3 (RD)  
Intensive practice in craft of poetry for experienced writers.

Equivalent to ENGL 750 (2010-2011 Catalog)

**Prerequisite(s):** Admission to MFA concentration in poetry, ENGL 564/ENGH 564, and ENGL 617/ENGH 617.

**Notes:** May be repeated for credit with permission of department.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ENGH 751 - Advanced Workshop in Fiction Writing**

Credits: 1-6 (RD)  
Intensive practice in craft of fiction for experienced writers.

Equivalent to ENGL 751 (2010-2011 Catalog)

**Prerequisite(s):** Admission to MFA concentration in fiction, ENGL 566/ENGH 566, and ENGL 618/ENGH 618.

**Notes:** May be repeated for credit with permission of department.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

**ENGH 752 - Advanced Workshop in Nonfiction Writing**

Credits: 1-6 (RD)  
Intensive practice in craft of nonfiction for experienced writers.

Equivalent to ENGL 752 (2010-2011 Catalog)

**Prerequisite(s):** Admission to MFA concentration in nonfiction, ENGL 565/ENGH 565 and ENGL 616/ENGH 616.

**Notes:** May be repeated for credit with permission of department.
**ENGH 790 - Projects in Literary Studies**

Credits: 3 (NR)
Students complete a capstone project guided by instructor and a faculty consultant based on work produced in a previous graduate course. Class meetings focus on building skills in research, revision, and editing, discussing topics related to professionalization both in and out of academia, and revising work in a workshop environment. Students will produce a professional-quality article or similar final project.

Prerequisite(s): 21 credits in MA coursework including ENGH 701, permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**Grading:** Satisfactory/No Credit
**When Offered:** Spring.

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**ENGH 797 - Projects in Professional Writing and Rhetoric**

Credits: 3 (NR)
Students complete a capstone project guided by instructor and a faculty consultant. Reflecting on theories and methods learned in previous course work and applying them to a concrete rhetorical situation, students produce a professional-quality project for a primary audience located in the professional workplace or the discipline of rhetoric and professional writing.

Equivalent to ENGL 797 (2010-2011 Catalog)

Prerequisite(s): 21 credits in MA coursework, including the core, theory, PWR and Writing requirements, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**Grading:** S/NC

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**ENGH 798 - Directed Reading and Research**

Credits: 1-6 (RT)
Reading, research, and writing on specific project under direction of department member.

Equivalent to ENGL 798 (2010-2011 Catalog)

Prerequisite(s): Open only to degree students who have preregistered and have completed 15 credits, including ENGL 701/ENGH 701.

Notes: Oral or written report required. For MA students: May be repeated for a maximum of 6 credits with permission of department. For MFA students: May be repeated for a maximum of 12 credits; 12 credits may be applied to the MFA.
requirements but no more than 3 credits may count toward completing the literature requirement.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

### ENGH 799 - Thesis

Credits: 1-6 (RD)  
Students who take ENGH 798 to develop thesis topic and then elect thesis option receive 3 credits for ENGH 799 on completion of thesis. Students who do not take ENGH 798, or who take it to work on project unrelated to thesis, receive up to 6 credits for ENGH 799 on completion of thesis.

Equivalent to ENGL 799 (2010-2011 Catalog)

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

### ENGH 822 - Studies in Composition

Credits: 3 (RT)  
Offers advanced study of theoretical, practical, or pedagogical topics related to composition.

**Notes:** May be repeated for a maximum of 12 credits when topic is different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 824 - Studies in Professional Writing

Credits: 3 (RT)  
Offers advanced study of theoretical, practical, or pedagogical topics related to professional writing and technical communication.

**Notes:** May be repeated for a maximum of 12 credits when topic is different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### ENGH 826 - Studies in Public Rhetorics

Credits: 3 (RT)  
Offers advanced study of theoretical, practical, or pedagogical topics related to public rhetorics.
Notes: May be repeated for a maximum of 12 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ENGH 897 - Directed Research**

Credits: 1-3 (RD)
Reading, research, and writing on a specific project under direction of faculty member.

Prerequisite(s): Permission of Instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

**ENGH 898 - Qualifying Exams Seminar**

Credits: 1-3 (RD)
Work on PhD qualifying exams.

Prerequisite(s): Completion of 36 credits in coursework in the PRWP PhD Program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit.

**ENGH 998 - Doctoral Dissertation Proposal**

Credits: 1-6 (RD)
Work on research proposal that forms the basis for the doctoral dissertation.

Prerequisite(s): Advancement to candidacy.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

**ENGH 999 - Doctoral Dissertation**

Credits: 1-12 (RD)
Doctoral dissertation research and writing under direction of student’s dissertation committee.
Prerequisite(s): Completion of ENGH 898.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

Enterprise Engineering and Policy (EEP)

EEP 601 - Introduction to Enterprise Engineering: Engineering and Policy

Credits: 3 ()
Provides overview of extended enterprise integration using modern standard software solutions and tools. Focuses on integration and management aspects of extended enterprise solutions. Topics include enterprise resource planning and e-business extensions. Students must demonstrate complete proficiency in modern implementation methodology and supporting tools.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EEP 602 - Decision Support for Enterprise Integration

Credits: 3 ()
Lectures focus on using "business intelligence" to enhance competitive advantage, developing information-driven set of controls to improve profitability, and creating balanced business with aligned corporate direction and strategic intent. Examines solutions within enterprise resource planning systems.

Prerequisite(s): EEP 601.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EEP 603 - Supply Chain Integration and Management (Business-to-Business Electronic Commerce)

Credits: 3 ()
Focuses on two issues: supply chain integration from information technology perspective, and supply chain management from decision support perspective. Course motivation is merging of enterprise computing with operations research, primarily through customer and supply chain management systems. Topics include enterprise resource planning and web integration, advanced planning and scheduling, and CPFR.

Prerequisite(s): EEP 601.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EEP 604 - E-Commerce Architectures (Business-to-Consumer Electronic Commerce)

Credits: 3 ()
Introduces network and system architectures that support high-volume, business-to-consumer web sites and portals. Provides insight into structure of modern web-enabled storefront. Critical business and technology issues include storage area networks, server clustering, load balancing techniques at server and network levels, fault tolerance, and recovery of database and application servers.

Prerequisite(s): EEP 601.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EEP 605 - Economics of Electronic Commerce

Credits: 3 ()
Focuses on gaining competitive advantage through electronic commerce implementation; identification and growing of new market opportunities and electronic enabling of existing business relationships; business-to-consumer relationships and economics of strategic procurement; enterprise resource planning hosting; customer relationship management; catalog hosting; portal operations; and supplier management.

Prerequisite(s): EEP 601.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EEP 606 - Customer Relationship Management

Credits: 3 ()
Modern world of e-commerce extends intraenterprise integration, as implemented in enterprise resource planning systems, to include external constituents such as customers, partners, and suppliers. Course focuses on modern system support for demand chain, and value-creation process that results from integrating "front office" and "back office" systems.

Prerequisite(s): EEP 601.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EEP 607 - Critical Information Technology Infrastructures

Credits: 3 ()
Focuses on design and implementation of high-speed network and application services in support of modern enterprise resource planning (ERP) systems. Critical technologies include high-speed data communication, switched vs. routed data flow, workflow engines, business rule and web application servers, and load-balancing technologies. Large-scale, web-enabled ERP system
architecture examined in detail.

Prerequisite(s): EEP 601.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EEP 608 - Optimization of Supply Chains

Credits: 3 ()
Focuses on supply chain optimization from enterprise-wide perspective, and supply chain optimization from business-to-business e-commerce perspective. Explores optimizing value of goods and services and assuring reasonable return on such sales. Describes heuristic and exact algorithms for scheduling, production, inventory management, logistics, and distribution. Presents new software that enables such optimization, and new techniques to handle risk, quality of data, and robustness of solutions. Outlines manufacturing and service examples from public and private sectors. Students perform case studies using state-of-art software.

Prerequisite(s): MATH 203 and 213, and graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EEP 609 - Special Topics in Enterprise Engineering and Policy

Credits: 1-3 ()
Topics not covered in regular EEP course offerings; content varies each semester.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

EEP 610 - Project in Enterprise Engineering and Policy

Credits: 3 (RD)
Focuses on completing capstone project in enterprise engineering and policy. Designed as two-semester project, with student closely guided by faculty advisor.

Prerequisite(s): Admission to EEP program.

Notes: Topic selected by mutual agreement with faculty advisor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

Environmental Science and Public Policy (EVPP)
Offered by the College of Science

See additional course work under Biology (BIOL), Chemistry (CHEM), Public and International Affairs (PUAD), School of Public Policy (PUBP), Geography (GEOG), and Geology (GEOL)

EVPP 110 - The Ecosphere: An Introduction to Environmental Science I

Credits: 4 (NR)

Studies components and interactions that make up natural systems of our home planet. Teaches basic concepts in biological, chemical, physical, and earth sciences in integrated format with lecture, laboratory, and field exercises. Designated a Green Leaf Course.

Fulfills general education requirement in natural science (lab).

Notes: One of two semesters of environmental lab science that fulfills general education science requirements for non science majors. Along with EVPP 111, can be taken in any order.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

EVPP 111 - The Ecosphere: An Introduction to Environmental Science II

Credits: 4 (NR)

Studies components and interactions that make up natural systems of our home planet. Teaches basic concepts in biological, chemical, physical, and Earth sciences in integrated format with lecture, laboratory, and field exercises. Designated a Green Leaf Course.

Fulfills general education requirement in natural science (lab).

Notes: One of two semesters of environmental lab science that fulfills general education science requirements for non science majors. Along with EVPP 110, can be taken in any order.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

EVPP 201 - Environment and You: Issues for the Twenty-First Century

Credits: 3 (NR)

Introduces broad aspects of human-environmental interactions in the contemporary world. Topics range broadly from global populations and wastewater treatment to environmental law, and genetic engineering. Includes both science and science policy of the environment.
Designated a Green Leaf Course.

Fulfills general education requirement in natural science (nonlab).

**EVPP 305 - Environmental Microbiology Essentials**

Credits: 3 (NR)
Provides understanding of microbes and their function as a vital part of an environmental education. The role of microbes is central to many environmental issues such as climate change, biodegradation of toxics, wastewater treatment and drinking water contamination. Course provides an introduction to the breadth of microbiology including essential information for students studying environmental problems and their solution.

Prerequisite(s): EVPP110 and 111 or BIOL 213, and 30 semester hours, or Permission of Instructor.

Corequisite(s): EVPP 306

Notes: Laboratory section (EVPP306 proposed) is a corequisite unless previously completed

**EVPP 306 - Environmental Microbiology Essentials Laboratory**

Credits: 1 (NR)
Laboratory study of environmental microbiology. Course provides an introduction to the microbiological techniques for students studying environmental problems and their solution. Examples include wastewater treatment - a microbial reactor metabolizing organic matter, drinking water quality - is based on detection and quantification of coliform bacteria, visualization of bacteria in their natural habitat.

Prerequisite(s): EVPP 110 and 111 or BIOL 213, and 30 semester hours

Corequisite(s): EVPP 305

Notes: Lecture section (EVPP 305 proposed) is a corequisite.

**EVPP 318 - Conservation Biology**

Credits: 3 (NR)
Introduces science used to identify species in need of conservation, and techniques to manage and protect organisms.
Equivalent to BIOL 318

Prerequisite(s): BIOL 307 and 311.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 322 - Business and Sustainability

Credits: 3 (NR)

Examines the types of approaches businesses can take to take to respond to sustainability concerns. Designed to prepare students for assisting organizations to incorporate sustainability considerations into their strategic decision-making. Designated a Green Leaf Course.

Prerequisite(s): 30 credit hours, recommend EVPP 361/GOVT 361 - Introduction to Environmental Policy

Notes: Students from multiple disciplines (business, social sciences, natural sciences, humanities, education, etc.) can participate in the class without having had previous courses in management.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

EVPP 335 - People, Plants, and Culture

Credits: 3 (NR)

Introduces students to the complex interactions of people and plants in historical and contemporary times. The course is team taught by professors of both natural and social science. The instructors will lend their expertise to fully address the fundamental links between botany, human ecology, and environmental health and sustainability. Designated a Green Leaf Course.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 336 - Human Dimensions of the Environment

Credits: 3 (NR)
Overview of current knowledge regarding human and environment interactions and human ecology. Topics include basic theoretical and conceptual issues, relationship between social and biological sciences, human causes and consequences of environmental change, and contemporary perspectives on environmental issues. Designated a Green Leaf Course.

**Prerequisite(s):** One of EVPP 110, EVPP 111, GEOL 101, SOCI 101, or ANTH 114

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EVPP 337 - Environmental Policy Making in Developing Countries**

Credits: 3 (NR)

Overview of environmental policy process in developing countries around the world. Major focus on understanding distinctive problems and dynamics of environmental policy making in poor countries to generate better policy decisions and management. Designated a Green Leaf Course.

Fulfills writing intensive requirement in the global affairs major.

**Prerequisite(s):** 60 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EVPP 338 - Ecological Economics**

Credits: 3 (NR)

Introduction to environmental, resource, and ecological economics for non-economist undergraduates. Covers basic theories of scarce resource allocation and examines conditions under which market allocations are efficient and sustainable. Includes graphical and verbal presentation of theory. Designated a Green Leaf Course.

**Prerequisite(s):** 60 units completed.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EVPP 350 - Freshwater Ecosystems**

Credits: 4 (NR)

Studies physical, chemical, and biological processes in lakes, streams, and wetlands. Teaches physical and chemical aspects of aquatic systems and life cycles, and adaptations of aquatic organisms. Lectures, field trips, lab exercises.
Equivalent to BIOL 350

Prerequisite(s): Either CHEM 211/212 or CHEM 155/156 and either EVPP 110/111 or BIOL 307.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

EVPP 355 - Ecological Engineering and Ecosystem Restoration

Credits: 4 (NR)

Provides definition, classification, and practice of ecological engineering and ecosystem restoration. Describes general system ecology, ecosystem restoration (i.e., wetland and river systems), and the use of natural processes to provide ecosystem services to society. Provides students with a systems-oriented perspective on designing and managing ecosystems. Students will study principles in designing field ecological studies, ecological models, ecological engineering, and explore practices in sustainable ecological design by carrying out a hands-on experimental design project with the field wetland mesocosm on the Mason campus. One field trip is required part of the course. Designated a Green Leaf Course.

Equivalent to BIOL 355

Prerequisite(s): CHEM 211, BIOL 308, PHYS 243 and/or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

EVPP 361 - Introduction to Environmental Policy

Credits: 3 (NR)

Environmental politics and policymaking since the 1970s. Primary focus on United States, with some discussion of global issues. Examines policy strategies and outcomes, ethical and economic debates, political controversies, lawmaking and enforcement, and role of key players. Designated a Green Leaf Course.

Equivalent to GOVT 361

Prerequisite(s): 30 credit hours

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 362 - Intermediate Environmental Policy
Examines environmental issues building on learning objectives from EVPP 361. Focuses on environmental and policy issues in the US and internationally, exploring the politics of nature and the interaction of environmental science and politics and resulting controversy. Risk and uncertainty loom large in most environmental issues. "Natural" disasters as well as direct "man-made" problems will be covered.

Prerequisite(s): EVPP 361 or GOVT 361 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**EVPP 363 - Coastal Morphology and Processes**

Credits: 4 (NR)
Studies global coastal geomorphology and processes with emphasis on U.S. Atlantic and gulf coasts. Topics include plate tectonics; sea-level changes; sediment supply; impact of waves, tides, and storms; and human activities. Lectures and extended weekend field trips to mid-Atlantic coast.

Equivalent to EVPP 563/GEOL 363

Prerequisite(s): GEOL 309, BIOL 309, or GEOL 317; or 9 credits in geography, including GGS 309.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

**EVPP 377 - Applied Ecology**

Credits: 3 (NR)
Introduces ecosystem concepts and applications to natural and managed ecosystems.

Equivalent to BIOL 377

Prerequisite(s): 60 credits, including 8 credits of biology, geology, or chemistry; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 378 - Ecological Sustainability**

Credits: 4 (NR)
Introduces the concepts and applications of several important topics relating to ecological sustainability. Focuses on the role of soils in maintaining and managing environmental quality. The teaches students how to understand and interpret scientific data presented in various types of literature covering ecological sustainability.
Designated a Green Leaf Course.

Equivalent to BIOL 379

Prerequisite(s): BIOL 308 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Spring.

**EVPP 380 - Wetlands of the World**

Credits: 4 (NR)
A study of the ecosystems of the world. Emphasizes different types of wetland ecosystems and their services, including water quality, coastal protection, flood mitigation, and wildlife protection. The course includes trips to local wetlands and to the Everglades National Park.

Prerequisite(s): BIOL 308 or 310 or EVPP 110-111 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**EVPP 395 - Undergraduate Research in Environmental Science and Policy**

Credits: 1-3 (RD)
Original research project. May involve field and lab study, computer modeling and analysis, or other original research as appropriate. Research formulated and completed under instructor's guidance.

Prerequisite(s): 45 credits including at least two upper-level science lab courses.

Notes: Culminates in final report. May be repeated for total 10 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**EVPP 396 - Directed Topic in Environmental Science and Policy**

Credits: 1-4 (RD)
Study of topics not available in fixed-topics courses. May involve readings, lectures, lab assignments, and tutorials as jointly agreed on by student and instructor.

Prerequisite(s): 45 credits.

Notes: Culminates in term paper, final exam, or both. May be repeated for maximum 8 credits.
EVPP 419 - Marine Mammal Biology and Conservation

Credits: 3 (NR)
Covers the evolution, biology, ecology, and behavior of marine mammals from polar bears and sea otters to whales and dolphins. Marine mammal conservation and policy is also a major component of the course; several lecture sessions are devoted to the issue of whaling, threats to marine mammal populations, and recent conservation issues such as marine mammals and noise pollution. The course also includes a number of guest lectures from a variety of international marine mammal experts.

Equivalent to EVPP 519/Biol 508

Prerequisite(s): BIOL/GEOL 309 or BIOL 449; 60 credit hours.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 420 - Marine Mammal Biology and Conservation Field Course

Credits: 1 (NR)
This course provides laboratory, seminar sessions and field work to accompany EVPP 419-001 - marine mammal biology and conservation. Field work includes several day-long boat trips. The field course may take place in the US or abroad.

Prerequisite(s): EVPP 419 or BIOL 454

Corequisite(s): EVPP 419 or BIOL 454

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 1-12
When Offered: Summer

EVPP 421 - Marine Conservation

Credits: 3 (NR)

Provides an overview of threats to the marine environment, and discusses the scientific, socioeconomic, and political issues behind marine conservation. Covers categories of marine pollutants (chemical, biological, and physical contaminants) and their impacts on the marine ecosystem, as well as impacts on humans (health, social, and economic), threats to key marine species (e.g., coral, sharks, turtles, and marine mammals) and initiatives and laws developed to reduce these threats. Scientific and socioeconomic problems that hinder sustainable fisheries management and the science and policy behind the global warming debate are also discussed. Provides an overview of marine environmental law and policy issues related to marine conservation policy.
Designated a Green Leaf Course.

Equivalent to EVPP 521/Biol 507
Prerequisite(s): BIOL/GEOL 309 and completed or concurrent enrollment in all other required general education courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 430 - Fundamentals of Environmental Geographic Information Systems

Credits: 3 (NR)
Provides the basic knowledge to explore complex environmental data sets and relationships among biological, ecological, physical and anthropogenic variables using geographic information systems. Using spatial mapping and exploration tools students will be capable of independent analysis of complex environment.

Prerequisite(s): EVPP 110 and 111, and IT 103 or CDS 103, and 60 credits or Permission of Instructor.

Notes: Previous knowledge of fundamentals of geography, coordinate systems and map projections is an asset. Knowledge of operating systems, text editor and spreadsheet is required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer

EVPP 432 - Energy Policy

Credits: 3 (NR)
Overview of energy policy issues, including different energy sources, electricity generation, efficiency and conservation, energy economics, related energy issues, such as climate change, energy in a global context, transmission of power, and others. Updated yearly. One field trip is part of the course.

Prerequisite(s): 60 credits and EVPP 361/GOVT 361, or Permission of Instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

EVPP 436 - The Human Dimensions of Global Climate Change

Credits: 3 (NR)
Social science investigation of humans' role(s) in global climate change, including diversity of ecological, cultural and policy issues. Focuses on current science, causes and responses, human rights and social justice, vulnerability of marginalized populations, relevant issues associated with communication and behavior change, place of policy, and the multiple existing and potential roles of academic action. Discussion format.

Prerequisite(s): EVPP 336, CLIM 101 and 60 credits, or Permission of Instructor

Hours of Lecture or Seminar per week: 3
**EVPP 445 - Principles of Environmental Toxicology**

Credits: 3 (NR)
Explores basic principles of toxicology with an emphasis on the environment. Includes the history and scope of the field; absorption, distribution, metabolism and excretion of toxicants; mechanisms of toxic action; genetic toxicology; ecotoxicology as well as specific examples important toxicants. Introduces regulatory toxicology and human and ecological risk assessment.

**Prerequisite(s):** EVPP 110, 111 and Chem 211,212 and 60 credit hours; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**EVPP 451 - Fungi and Ecosystems**

Credits: 3 (NR)  
Considers impact of fungi on ecosystems in terms of effects on biogeochemical cycling, primary and secondary production, and regulating community structure and populations of individual species through activities as symbionts and parasites.

Equivalent to EVPP 551; BIOL 459; BIOL 559

**Prerequisite(s):** BIOL 304 or course in microbiology; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EVPP 468 - Vertebrate Natural History**

Credits: 4 (NR)  
Introduces vertebrates with emphasis on systematics, evolution, life history, behavior, and ecology. Laboratory emphasis on identification, taxonomy, and natural history of local vertebrates.

Equivalent to BIOL 468

**Prerequisite(s):** BIOL 303 and BIOL 307 or permission of the instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3  
**When Offered:** Fall

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**EVPP 480 - Sustainability in Action**
Provide students with valuable and tangible experience in practical aspects of realizing sustainability goals and to transfer theory into practice. Allows students to engage in real-world, sustainability-related projects that provide benefits for a target community. Identify and attempt to solve a sustainability-related problem or address a sustainability-related need in a specific target community.

Designated a Green Leaf Course.

**Prerequisite(s):** Completed or concurrent enrollment in all other required general education courses; 60 credit hours completed.

**Notes:** Capstone course for the Sustainability Minor – see Environmental Science and Policy department listing for details.

**EVPP 490 - Special Topics in Environmental Science and Policy**

Credits: 0-4 (RD)

Studies selected topics in environmental science and policy using lectures, guest lectures, student presentations, or laboratory exercises.

**Prerequisite(s):** 60 credits, and permission of instructor.

**Notes:** Topics vary, but each offering has coherent syllabus. May be repeated for credit if topics are significantly different.

**Hours of Lecture or Seminar per week:** 1-4

**Hours of Lab or Studio per week:** 1-4

**EVPP 503 - Field Mapping Techniques**

Credits: 3 (NR)

Basic techniques for collecting, recording, and plotting spatial field data, including topographic maps, compass, transit, alidade, and global positioning systems. Field work and field-based research project.

Equivalent to GEOL 303

**Prerequisite(s):** MATH 105 or equivalent; and EVPP 110, GGS 102, or GEOL 101 or equivalent.

**Hours of Lecture or Seminar per week:** 3

**Hours of Lab or Studio per week:** 6

**EVPP 505 - Selected Topics in Environmental Science**

Credits: 0-4 (RT)

Topic depends on instructor's specialty.
**Prerequisite(s):** Course in ecology or geology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0-6

**EVPP 506 - Science of the Environment I**

Credits: 3 (NR)
Environmental science is explored in this 2-semester sequence providing the foundation in chemistry (I) and biology (II) required for graduate students with social sciences backgrounds seeking a degree and career in environmental science and policy.

**Prerequisite(s):** Permission of the instructor.

**Notes:** For graduate students entering the Environmental Science and Policy or other programs. Not available to students with undergraduate degrees in the natural sciences. This course is in addition to all other degree requirements.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EVPP 507 - Science of the Environment II**

Credits: 3 (NR)
Environmental science is explored in this 2-semester sequence providing the foundation in chemistry (I) and biology (II) required for graduate students with social sciences backgrounds seeking a degree and career in environmental science and policy.

**Prerequisite(s):** EVPP 506 or permission of instructor.

**Notes:** For graduate students entering the Environmental Science and Policy or other programs. Not available to students with undergraduate degrees in the natural sciences. This course is in addition to all other degree requirements.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EVPP 515 - Molecular Environmental Biology I**

Credits: 3 (NR)
Introduces molecular environmental biology covering basic concepts of molecular biology, molecular evolution, and bioinformatics, and application to problems in molecular and environmental biology.

**Prerequisite(s):** Introductory biology and genetics course, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EVPP 518 - Conservation Biology**
Credits: 3 (NR)
Introduction to the science used to identify species in need of conservation, and techniques to manage and protect organisms.

Prerequisite(s): Course in Ecology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**EVPP 519 - Marine Mammal Biology and Conservation**

Credits: 3 (NR)
Covers the evolution, biology, ecology, and behavior of marine mammals from polar bears and sea otters to whales and dolphins. Marine mammal conservation and policy is also a major component of the course; several lecture sessions are devoted to the issue of whaling, threats to marine mammal populations, and recent conservation issues such as marine mammals and noise pollution. The course also includes a number of guest lectures from a variety of international marine mammal experts.

Equivalent to EVPP 419/BIOL 508

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 521 - Marine Conservation**

Credits: 3 (NR)

Provides an overview of threats to the marine environment, and discusses the scientific, socioeconomic, and political issues behind marine conservation. Covers categories of marine pollutants (chemical, biological, and physical contaminants) and their impacts on the marine ecosystem, as well as impacts on humans (health, social, and economic), threats to key marine species (e.g., coral, sharks, turtles, and marine mammals) and initiatives and laws developed to reduce these threats. Scientific and socioeconomic problems that hinder sustainable fisheries management and the science and policy behind the global warming debate are also discussed. Provides an overview of marine environmental law and policy issues related to marine conservation policy. Designated a Green Leaf Course.

Equivalent to EVPP 421/BIOL 507

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 524 - Introduction to Environmental and Resource Economics**

Credits: 3 (NR)
Introduces theory of external costs and benefits, public goods, natural resource management, and benefit and cost analysis for noneconomists. Lecture-discussion format with student presentations and participation. Analytical problems set, short writing assignments, and exams.
Equivalent to GGS 524

Prerequisite(s): Basic algebra skills.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 525 - Economics of Human/Environment Interactions**

Credits: 3 (NR)

Advanced topics in environmental, natural resource, and ecological economics for noneconomist. Emphasizes sustainability, intergenerational equity, and economic-ecological feedbacks.

Designated a Green Leaf Course.

Equivalent to ECON 895/GGS 525

Prerequisite(s): EVPP 524/GGS 524 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 531 - Land-use Modeling Techniques and Applications**

Credits: 3 (NR)

Surveys literature on spatially explicit empirical models of land-use change. Offers hands-on experience developing and running simple models. Includes statistical models, mathematical programming models, cellular automata, agent-based models, and integrated models.

Equivalent to GGS 531

Prerequisite(s): GGS 550, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 532 - Animal Behavior**

Credits: 3 (NR)

Ecological aspects of animal behavior.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
EVPP 536 - Ichthyology

Credits: 4 (NR)
Studies systematics, evolution, physiology, ecology, and behavior of fishes. Lab time used for field trips, practice in identifying species, and hands-on experience with lecture subjects.

Equivalent to BIOL 536

Prerequisite(s): Ecology course, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

EVPP 537 - Ornithology

Credits: 4 (NR)
Study of evolution, systematics, physiology, ecology, and behavior of birds, emphasizing field work.

Prerequisite(s): Course in ecology or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Spring

EVPP 538 - Mammalogy

Credits: 4 (NR)
Study of evolution, systematics, physiology, ecology, and behavior of mammals, emphasizing fieldwork.

Equivalent to BIOL 538

Prerequisite(s): BIOL 303 and BIOL 307 or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall

EVPP 539 - Herpetology

Credits: 4 (NR)
Study of evolution, systematics, physiology, ecology, and behavior of amphibians and reptiles, emphasizing field work.
**Prerequisite(s):** Course in ecology or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1  
**When Offered:** Spring

**EVPP 543 - Tropical Ecosystems**

Credits: 4 (NR)  
Terrestrial, aquatic, and marine ecosystems in the tropics, emphasizing plant communities, plant-animal interactions, and role of humans in tropics.

Equivalent to BIOL 543  
**Prerequisite(s):** Ecology course, and permission of instructor.

**Notes:** Requires field trip to tropics as part of lab.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

**EVPP 550 - Waterscape Ecology and Management**

Credits: 3 (NR)  
Studies physical, chemical, and biological components of freshwater ecosystems with emphasis on streams, rivers, and lakes; links between watersheds and freshwater ecosystems; and impact of human management.

Equivalent to BIOL 550  
**Prerequisite(s):** A course in chemistry and a course in ecology.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EVPP 551 - Fungi and Ecosystems**

Credits: 3 (NR)  
Considers impact of fungi on ecosystems in terms of effects on biogeochemical cycling, primary and secondary production, and regulating community structure and populations of individual species through activities as symbionts and parasites. Discusses role of fungi in ameliorating pollutants produced by anthropogenic activities.

Equivalent to EVPP 451; BIOL 459; BIOL 559  
**Prerequisite(s):** BIOL 304 or course in microbiology, or permission of instructor.
EVPP 555 - Lab in Waterscape Ecology

Credits: 1 (NR)
Field and laboratory approaches to freshwater ecology with emphasis on study design, sampling methods, laboratory and data analysis, and report writing.

Equivalent to BIOL 555

Prerequisite(s): EVPP 550 or permission of instructor.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 3

EVPP 563 - Coastal Morphology and Processes

Credits: 4 (NR)
Studies global coastal geomorphology and processes, emphasizing U.S. Atlantic and gulf coasts. Topics include plate tectonics; sea-level changes; sediment supply; impact of waves, tides, storms; and human activities. Lecture, extended weekend field trips to mid-Atlantic coast.

Equivalent to EVPP 363/GEOL 363

Prerequisite(s): Previous courses in geology, oceanography, marine science or physical geography; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

EVPP 576 - Microbial Ecology of Soils

Credits: 3 (NR)
Surveys microbial ecology in surface and subsurface soils. Describes organisms and their function and interaction.

Equivalent to BIOL 576

Prerequisite(s): Course in microbiology or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 577 - Biogeochemistry: A Global Perspective
Credits: 3 (NR)
Structure and function of ecosystems, their interactions as components of landscapes, and contributions to the global environment. Emphasizes biogeochemical cycles of natural, disturbed, and managed ecosystems, and integration at landscape and global level as related to current ecological problems such as transfer of nonpoint source pollutants, atmospheric deposition, stratospheric ozone depletion, and global change.

Equivalent to BIOL 577

Prerequisite(s): Course in ecology and course in chemistry; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 581 - Estuarine and Coastal Ecology

Credits: 3 (NR)
Emphasizes marine biology of estuarine and coastal habitats of Chesapeake Bay region, and factors affecting distribution and abundance of organisms.

Equivalent to BIOL 581

Prerequisite(s): Course in ecology and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 582 - Estuarine and Coastal Ecology Laboratory

Credits: 1 (NR)
Provides training in field measurement of physical and chemical parameters, and collection and identification of local organisms. Emphasizes the practice of ecological field research.

Equivalent to BIOL 582

Prerequisite(s): EVPP 581/BIOL 581

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 3

EVPP 607 - Fundamentals of Ecology

Credits: 3 (NR)
Overview of concepts in physiological, population, community, ecosystem, biogeographical and human ecology.

Equivalent to BIOL 607

Notes: Restricted to graduate students with little or no background in ecology. Students who have taken BIOL 307 or the
equivalent elsewhere are ineligible for this course.

**EVPP 610 - Bioremediation: Theory and Applications**

Credits: 3 (NR)
Provides basis for understanding proper application of bioremedial technologies to treatment of hazardous wastes. Includes evaluation of data to determine successful treatment.

Equivalent to BIOL 610

**Prerequisite(s):** Courses in microbiology and either organic chemistry or biochemistry; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EVPP 613 - Environmental Geochemistry and Mineralogy**

Credits: 3 (NR)
Explores hot topics and aids students in developing intellectual skills to identify key research problems. Students will also improve their writing and presentation skills.

Equivalent to GEOL 613

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EVPP 615 - Molecular Environmental Biology II**

Credits: 4 (NR)
Applied course covering theory and methodology of molecular environmental biology, including analysis of selected case studies in conservation biology of macro-organisms, molecular systematics, and microbial ecology.

**Prerequisite(s):** EVPP 515 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 3

**EVPP 620 - Development of U.S. Environmental Policies**
Examines nature and historical development of environmental policy in the United States, including consideration of social, political, economic and environmental factors, and ways it is expressed and implemented. Also considers sustainability and emerging issues.

Designated a Green Leaf Course.

Prerequisite(s): 8 graduate credits including graduate course in policy process and course in ecology; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 621 - Overview of Biodiversity Conservation

Credits: 3 (NR)

Lectures, reading assignments, class discussions, and orally presented and written case studies to explore what biodiversity is, why it is important, how conservation has evolved, and status today.

Prerequisite(s): 8 graduate credits in ecology and environmental science or environmental policy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 622 - Management of Wild Living Resources

Credits: 3 (NR)

Examines management of different types of wild living resources: animal and plant, aquatic and terrestrial. Reviews status of resources, analyzes factors that have led to present situation, and considers what may be required to achieve effective and sustainable management.

Designated a Green Leaf Course.

Prerequisite(s): 8 graduate credits of ecology or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 623 - Translating Environmental Policy into Action

Credits: 3 (NR)

Guest lecturers, class discussions, written and orally presented case studies, and assigned reading to identify and analyze factors involved in moving from science and policy to concrete action. Provides understanding of basic principles, skills, and strategies.

Prerequisite(s): 8 graduate credits in environmental science or environmental policy, or permission of instructor.
**EVPP 626 - Environment and Development in Asia**

Credits: 3 (NR)

Examine environment and development in selected countries of South, Southeast, and East Asia. Reviews relationship between environment and development, considers background and history leading up to the present, and considers requirements to achieve more effective and sustainable results. Designated a Green Leaf Course.

**Prerequisite(s):** 8 graduate credits in policy process, international development, and ecology; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EVPP 627 - Environmental Policy in Latin America**

Credits: 3 (NR)

Examine environmental policy in Latin America. Reviews evolution of environmental policy and relationship between environment and development, considers background and history leading up to the present, and considers requirements to achieve more effective and sustainable results. Designated a Green Leaf Course.

**Prerequisite(s):** 8 graduate credits in policy process, international development, and ecology; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EVPP 628 - Environment and Development in Africa**

Credits: 3 (NR)

Examine environment and development in sub-Saharan Africa. Reviews relationship between environment and development, considers background and history leading up to present, and considers requirements to achieve more effective and sustainable results. Designated a Green Leaf Course.

**Prerequisite(s):** 8 graduate credits in policy process, international development, and ecology; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
EVPP 630 - Methods and Logic of Social Inquiry

Credits: 3 (NR)
Emphasizes gathering, interpretation, and evaluation of scientific evidence. Develops critical thinking skills and covers logic of scientific inquiry, including various data collection methods such as experiments, observational research, and Q methodology.

Prerequisite(s): Undergraduate statistics and research methods, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 631 - Spatial Agent-based Models of Human-Environment Interactions

Credits: 3 (NR)
Discusses key challenges in spatial modeling of human-environment interactions. Reviews agent-based modeling applications in urban and rural interactions, agriculture, forestry, and other areas. Hands-on development of simple ABM models, and investigation of links between GIS and ABM.

Equivalent to CSI 709; GGS 631

Prerequisite(s): EVPP 531 or CSS 600, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 632 - Qualitative Research Methods for Environmental Scientists

Credits: 3 (NR)
Course engages questions of qualitative research methods for scientists conducting human-environment research. Focuses on tools to investigate the human-environment nexus, including community-based conservation and management research and decolonizing methodologies. Students discuss and practice 'triangulation'-- the integration of qualitative and quantitative methods-- a necessary skill for environmental/human-environment research.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 635 - Environment and Society

Credits: 3 (NR)

Human-environment interactions in human ecology perspective, historical basis of human environmental impact, indigenous and
nonindigenous worldviews in context of modernization, environmental degradation and globalization, and contemporary policy and research initiatives geared toward resilience and sustainability. Discussion format. Designated a Green Leaf Course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 636 - Gender, Race, and the Natural World**

Credits: 3 (NR)
Advanced study of links among gender, race, and nature using social-psychological framework, original sources, and seminar and discussion. Analyzes ideologies that underpin the interlocking narratives of gender, race, and nature, and examines role of science in producing these ideologies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 637 - Human Dimensions of Global Change**

Credits: 3 (NR)
Examines human dimensions of climate change, biodiversity loss, ozone depletion, and related anthropogenic alterations of biosphere.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 638 - Corporate Environmental Management and Policy**

Credits: 3 (NR)
Provides understanding of how environmental issues interact with business strategy decisions. Emphasizes learning about proactive win-win environmental management strategies being implemented by world's leading firms, and shows how government policies and regulations can be designed to simultaneously promote higher environmental protection and competitiveness. Combines mini lectures, participatory discussions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 641 - Environmental Science and Public Policy**

Credits: 3 (NR)
Effects of human activities on environment. Considers airborne, waterborne, and solid waste contaminants with respect to sources, control, and effect on ecosystems and humans. Focus is on scientific and technical aspects of environmental
contamination. Includes discussion of science policy related to these topics.

Prerequisite(s): Course in ecology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 642 - Environmental Policy

Credits: 3 (NR)

In-depth examination of U.S. efforts since 1970 to mitigate pollution of air, land, and water. Addresses issues of global concern, including biodiversity loss, ozone depletion, and climate change. Designated a Green Leaf Course.

Equivalent to PUAD 642

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 643 - Microbial Ecology

Credits: 4 (NR)

Studies relationships between microorganisms and their natural environment, and methodology for observing the microbes in nature and the biochemistry of environmental systems. Includes discussion of the role of microbes both in creating and removing toxic threats in the environment. Laboratory component includes field sampling/analyses and laboratory isolation and identification of microbes as well as measurement of their physiological activities.

Equivalent to BIOL 643

Prerequisite(s): Course in microbiology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

EVPP 645 - Freshwater Ecology

Credits: 3 (NR)

Studies biotic and abiotic interactions that affect structure and composition of freshwater ecosystems. Emphasizes research literature.

Prerequisite(s): EVPP 550, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EVPP 646 - Wetland Ecology and Management

Credits: 3 (NR)
Emphasizes structure, functions, and ecological processes of created and natural wetlands from an ecosystem perspective. Students will be expected to develop an understanding of hydrologic, physicochemical, and ecological aspects of wetlands and the management of these systems through in-class and field/lab works. Each student is required to carry out an individual research project that involves field and lab works, and write a research paper.

Prerequisite(s): BIOL 307 or EVPP 377, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 647 - Wetland Ecology Lab and Field

Credits: 1 (NR)
Use laboratory and field work to study the structure and function of wetland ecosystems.

Prerequisite(s): EVPP 646 (formerly EVPP 644)

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 3

EVPP 648 - Population Ecology

Credits: 3 (NR)
Surveys ecological models and theory. Topics include population growth and regulation, competition, predator-prey, herbivore-plant, and parasite-host interactions, mutualism, and metapopulation ecology.

Equivalent to BIOL 648

Prerequisite(s): Course in ecology or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 650 - Environmental Analysis and Modeling

Credits: 4 (NR)
Introduces principles, history, and methodologies of systems ecology, emphasizing development and simulation of ecological models for natural resource/ecosystem management, conceptual and symbolic models, and simulation techniques on microcomputers.

Prerequisite(s): Course in ecology or permission of instructor.
**EVPP 651 - Multivariate Data Analysis for Ecology and Environmental Science**

Credits: 3 (NR)
Provides graduate students in ecology and environmental science with tools needed to analyze multivariate data sets. Topics include classification and ordination.

**Prerequisite(s):** EVPP 607 or equivalent.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Spring

**EVPP 652 - The Hydrosphere**

Credits: 3 (NR)
Components and transfer processes within hydrosphere, which consists of aqueous envelope of Earth including oceans, lakes, rivers; snow, ice, glaciers, soil, moisture, ground water, and atmospheric water vapor.

Equivalent to GGS 656

**Prerequisite(s):** Two semesters of calculus and partial differential equation.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EVPP 670 - Environmental Law**

Credits: 3 (NR)
Studies environmental laws such as the National Environmental Policy Act, and regulatory issues such as the Clean Water and Clean Air Acts. Emphasizes critical evaluation of alternatives to unresolved issues in environmental policies.

Equivalent to BIOL 670

**Prerequisite(s):** Courses in ecology and environmental biology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**EVPP 675 - Environmental Planning and Administration**
Credits: 3 (NR)
Examines interaction of man and ecological systems; causes of damage or deterioration in environment; content, oversights, and externalities in management decision processes that affect environment and effectiveness of plan implementation; means of assessing environmental impact; and administrative approaches for minimizing environmental impact.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 677 - Applied Ecology and Ecosystem Management.**

Credits: 3 (NR)
Uses ecological principles to manage natural resources. Emphasizes hierarchical levels of organization within ecological systems, and management of ecosystems to conserve biodiversity, natural resources, and environment.

Prerequisite(s): BIOL 607 or EVPP 607 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 681 - Introduction to Bioinformatics**

Credits: 3 (NR)
Overview of methods and tools in bioinformatics including Internet interfaces to sequence databases, methods for performing searches of biological databases, sequence alignment, phylogenetic analysis, other types of DNA sequence analysis, web-based tools, and databases in structural biology.

Prerequisite(s): Course in molecular biology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 682 - Principles of Environmental Conflict**

Credits: 3 (NR)
Explores the nature and characteristics of environmental conflict and efforts to manage, resolve or transform it. Students will develop a capacity to assess the strengths and weaknesses of environmental conflict resolution processes while learning about best practices for preventing, preparing for, and addressing environmental conflict.

Equivalent to CONF 682

Prerequisite(s): EVPP 607, CONF 501, and CONF 502, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Credits: 3 (NR)
This course explores best practices for managing, resolving, and transforming environmental conflict using environmental conflict resolution (ECR) processes. Nature and dynamics of environmental disputes, methods for assessing conflict situations, and methods for conducting various forms of ECR processes will be covered in the context of selected case studies with emphasis on student involvement.

Equivalent to CONF 683

Prerequisite(s): EVPP 682 or CONF 682, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 684 - Environmental Conflict Resolution and Collaboration: Leadership Practicum/Capstone

Credits: 3 (NR)
This course is the capstone course for the Graduate Certificate in Environmental Conflict Resolution and Collaboration. Under supervision of the instructor, students will undertake an assessment of an active environmental conflict and recommend a range of processes that promote identified goals for preferred conflict outcomes.

Equivalent to CONF 684

Prerequisite(s): EVPP 682 or CONF 682, and EVPP 683 or CONF 683.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EVPP 692 - Master's Seminar in Environmental Science and Public Policy

Credits: 1 (RT)
Explores selected topics in environmental science and public policy using lectures, guest lectures, student presentations, and discussions of current literature.

Notes: Topics vary. May be repeated for credit.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EVPP 693 - Directed Studies in Environmental Science and Public Policy
Studies topic not otherwise available in graduate program. May involve reading assignments, tutorials, lectures, papers, presentations, and lab or field study determined in consultation with instructor.

**Prerequisite(s):** Permission of instructor and chair.

**Notes:** Short study plan required. May not be used to fulfill explicit undergraduate prerequisites for graduate work.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

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**EVPP 730 - Environmental Policy Research in Practice**

Credits: 3 (RD)  
Course is designed for students interested in social science-oriented environmental research. Student learn how to ground their research ideas in social science theory, develop a central research question and construct original research hypotheses that are grounded in social science literature. They also hone their peer reviewing skills by assessing other students' research and offering constructive commentary.

**Prerequisite(s):** 12 credit hours of graduate course work at Mason or approval of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**EVPP 738 - Sustainable Enterprise Theory**

Credits: 3 (NR)  
This course is designed to critically evaluate the scholarly research related to sustainable enterprise. The class provides an overview of the major theories, research designs, and methodologies associated with this emerging research domain. Students apply these theories to develop social science research proposals for empirical investigation.

**Prerequisite(s):** EVPP 638 Corporate Environmental Management and Policy, equivalent class, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**EVPP 741 - Advanced Topics in Environmental Science and Public Policy**

Credits: 0-4 (RT)  
Studies selected advanced topics in environmental science and public policy. Lectures, guest lectures, student presentations, laboratory exercises.

**Prerequisite(s):** 8 credits of graduate course work in environmental science and public policy, or permission of instructor.
Notes: Topics vary; each offering has coherent theme. May be repeated for credit if topics significantly differ.

Hours of Lecture or Seminar per week: 0-4
Hours of Lab or Studio per week: 0-4

**EVPP 745 - Environmental Toxicology**

Credits: 3 (NR)
Studies nature, distribution, and interaction of toxic chemicals released into environment. Topics include acute, subchronic, and chronic toxicity testing; uptake, distribution and metabolism of toxins as well as their distribution in the environment. Emphasizes effects on nonhuman biota, detection and fate of chemicals, and includes discussion of implications for government regulation.

Equivalent to BIOL 745

Prerequisite(s): Courses in ecology and physiology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 758 - Environment and Public Policy**

Credits: 3 (NR)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EVPP 791 - Colloquium in Earth Systems Science**

Credits: 1 (NR)
Covers various parts of Earth systems. Invited talks by Mason faculty and primarily Earth science experts in region. Students graded on written reports demonstrating understanding of wide topics covered.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**EVPP 792 - Seminar in Earth Systems Science**

Credits: 2 (NR)
Seminar for Earth systems science graduate students with background in major systems. Capstone experience. Seminars presented by faculty and students.

Equivalent to GGS 792

Prerequisite(s): 15 graduate credits; and courses on atmosphere, hydrosphere and lithosphere.
EVPP 793 - Research in Environmental Science and Public Policy

Credits: 1-3 (RD)
Library, laboratory, or field investigation under supervision of instructor.

Prerequisite(s): 8 graduate credits in EVPP, and permission of instructor and chair.

Notes: Short proposal required. May be repeated for total of 6 credits.

EVPP 798 - Master's Research Project in Environmental Science and Public Policy

Credits: 1-3 (RD)
Experimental, observational, literature-based, or theoretical research project chosen and completed under guidance of faculty member. Proposal required before enrollment. Comprehensive report acceptable to student's committee required for completion.

Prerequisite(s): Approved project proposal, and permission of instructor and chair.

Notes: Students taking EVPP 798 may receive no more than 6 credits for both EVPP 793 and EVPP 798.

EVPP 799 - Master's Thesis in Environmental Science and Public Policy

Credits: 1-6 (RD)
Experimental, observational, or theoretical research under instructor's supervision that culminates in production of thesis. Thesis work should be potentially publishable.

Prerequisite(s): Approved thesis proposal, and permission of instructor and chair.

Notes: No more than 6 credits of EVPP 793 and EVPP 799 may be applied to master's degree.
EVPP 894 - Supervised Internship

Credits: 3-12 (RD)
Training in application of ecological skills to environmental management and policy under supervision of a qualified environmental scientist at governmental agency, consulting firm, industry, or other acceptable organization.

Prerequisite(s): Permission of student's doctoral committee, graduate program director and department chair.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EVPP 991 - Advanced Seminar in Environmental Science

Credits: 2 (RT)
Topics generally address interface between environmental science and public policy.

Prerequisite(s): 8 hours of ecology, or permission of instructor.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EVPP 998 - Doctoral Dissertation Proposal

Credits: 1-6 (RD)
Work on research proposal that forms basis for a doctoral dissertation.

Prerequisite(s): Admission to doctoral candidacy.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/IP

EVPP 999 - Doctoral Dissertation Research

Credits: 1-12 (RD)
Research on basic or applied problem in environmental science and public policy.

Prerequisite(s): Approval of dissertation proposal.

Hours of Lecture or Seminar per week: 0
Executive Master of Business Administration (EMBA)

Offered by the School of Management

EMBA 500 - Workshop

Credits: 0 (RT)
Workshop.

Prerequisite(s): Acceptance into EMBA program.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
Grading: Not Gradable.
When Offered: Fall, Summer, Spring.

EMBA 603 - Managerial Economics and the Decisions of the Firm

Credits: 3 (NR)
Develops and applies economic analysis tools in managerial decision situations. Focuses on economic analysis to understand firm's competitive environment.

Prerequisite(s): Admission to EMBA program, or permission of the director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall

EMBA 612 - Managing Costs and Evaluating Performance

Credits: 1-3 (NR)
Focuses on developing accounting information for use by managers in planning and control activities. Examines traditional and emerging cost-management systems. Special emphasis on information for decision-making, operational control, and performance evaluation.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall
EMBA 613 - Financial Reporting and Decision Making

Credits: 3 (NR)
Develops framework of concepts and procedures essential for interpreting general-purpose financial statements and internal managerial accounting reports. Emphasizes understanding basic concepts and applying selected procedures to problem-solving situations.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall

EMBA 623 - Marketing Management

Credits: 3 (NR)
Develops market-based knowledge and skills for effective marketing strategy design, implementation, and evaluation. Develops ability to make marketing decisions in wide variety of institutional and competitive situations. Addresses the importance of companies being market-driven and customer-focused. Emphasis on case studies, team work, and projects.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Spring

EMBA 633 - Statistics for Managers

Credits: 3 (NR)
Applies statistical methods in analyzing problems in business decision-making. Topics include descriptive statistics, probability distributions, estimation and hypothesis testing, and linear regression.

Prerequisite(s): Admission to EMBA program, or permission of the director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall

EMBA 638 - Strategies for Operations Management: Process and Supply Chain Leadership
Credits: 3 (NR)
Integrates theory and practice of operations management with mathematical modeling and quantitative techniques of management science. Addresses range of operations management issues, including technology and strategy decisions, systems design issues, project operations, quality control, and inventory planning.

Prerequisite(s): Admission to EMBA program, or permission of the director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Spring

EMBA 641 - Building the High-Performing Team

Credits: 0-3 (NR)
Develops the knowledge and skills needed for creating powerful, high-performance teams within and among organizational units. Strategies are offered for alignment of goals, building conditions for coordinated action, generating innovation, and resolving breakdowns.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 0-3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall

EMBA 643 - Managerial Finance

Credits: 3 (NR)
Introduces theories of finance and their application to the formulation of business policy. Topics include internal financial analysis, financial forecasting, valuation, risk and return analysis, capital allocation, and capital structure.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Spring

EMBA 653 - Organizational Behavior

Credits: 3 (NR)
Examines development, theories, and practice of management within organizations. Emphasizes human behavior and how it influences organizational effectiveness.

Prerequisite(s): Admission to EMBA program.
EMBA 660 - Management of Information Technology

Credits: 3 (NR)
Examines computer-based information technologies and their interrelation with management processes, especially problem-solving and decision-making at individual, work group, and organization levels. Topics include management information system life cycle, with emphasis on manager's perspective, and modeling and analysis to support decision-making.

Prerequisite(s): Admission to EMBA program, or permission of the director.

EMBA 673 - Legal Environment for Management

Credits: 1.5 (NR)
Examines the managerial impact of the law upon decision-making processes in business organizations. Lectures as well as discussions of judicial opinions and readings.

Prerequisite(s): Admission to EMBA program.

EMBA 674 - The Contemporary Ethical and Social Environment of Business

Credits: 1-3 (NR)
Designed to strengthen the ability to identify, critically analyze, appropriately respond to, and provide leadership regarding the issues of ethical and socially responsible behavior you may confront as an executive in charge of people, projects, and organizations.

Prerequisite(s): Admission to the EMBA program.
EMBA 678 - Strategic Management

Credits: 3 (NR)
Integrates business strategy and policy with functional knowledge developed in other courses and business practice. Issues include formulation of strategy, industry analysis, building core competencies, and strategy implementation.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 3
Grading: Graduate Special
When Offered: Spring

EMBA 703 - Financial Markets

Credits: 3 (NR)
Explores the relationships between financial markets and their impact on corporate financial decision making. Considers cross-market interrelationships, including how financial markets respond by creating financial instruments to meet the varying financial requirements of business firms. The course includes a domestic financial residency in New York that focuses on contemporary developments in these markets.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 3
Grading: Graduate Special
When Offered: Fall

EMBA 709 - Global Capital Markets

Credits: 1-3 (NR)
Considers emerging topics in finance, with focus on links between global markets and strategic firm decisions. Emphasizes understanding valuation of strategic investment opportunities, and identification of financing alternatives.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Offered on an irregular basis at the discretion of the department or school

EMBA 710 - Business, Government, and the Global Economy

Credits: 1.5 (NR)
Focuses on the modern system of international trade and the opportunities that the global trading environment creates for firms. Attention will be directed toward the roles of national policies, international agreements, and business activities in the development of the system.
EMBA 712 - International Macroeconomics: Concepts and Country Strategy

Credits: 1.5 (NR)
Focuses on the basic concepts of international macroeconomics—national income accounts, monetary and fiscal policies, balance of payments, and exchange rates. These concepts are introduced and discussed in situations where national economic strategies affect the decisions and performance of business operations.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
When Offered: Fall

EMBA 715 - Special Topics in Accounting

Credits: 1-6 (RT)
In-depth examination of advanced topics in accounting.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-12
Grading: Graduate Special
When Offered: Offered on an irregular basis at the discretion of the department or school

EMBA 716 - Managing Change

Credits: 1.5 (NR)
Focuses on how organizations can successfully adapt and change. Topics include understanding forces that make change necessary, developing vision of appropriate course, aligning organization behind that vision, and motivating people to achieve it.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall
EMBA 718 - Leadership and Managing Change

Credits: 3 (NR)
Focuses on the essential elements of successful organizational change. Emphasis on understanding the forces for change, as well as developing skills to manage a successful change process. Gives a deeper understanding of organizational leadership and an increased ability to be a successful leader. Incorporates and integrates theory, research, and application, with the ultimate goal of providing the student with practical information about leadership.

Prerequisite(s): Admission to the EMBA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

EMBA 725 - Leadership

Credits: 1.5 (NR)
Explores key leadership roles in organizations and their own leadership competencies. Provides understanding of leadership development, power and influence, motivation, strategic decision making, leading change, the influence of globalization and diversity on leadership, and ethical issues.

Prerequisite(s): Admission to the EMBA program or permission of the program director.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall

EMBA 735 - Systems Thinking for Business Performance

Credits: 1-3 (NR)
Enables students to develop, express, improve, and validate holistic mental models of problems. In doing so, they will build a foundation for better decision making leading to improved business performance. The main strength of the systems-thinking approach is its emphasis on long-term strategic outcomes as opposed to short-term tactical ones.

Prerequisite(s): Admission to the MBA program, or permission of the program director.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
When Offered: Fall

EMBA 745 - Special Topics in Finance

Credits: 1-6 (RT)
In-depth examination of advanced topics in finance.
Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Offered on an irregular basis at the discretion of the department or school

EMBA 750 - Capstone Project: Action Learning Project

Credits: 1.5 (RT)
The Integrated Project Application is a lab-based course designed to provide an action learning experience that integrates course content from throughout the EMBA program. Students work in teams to develop solutions to organizational challenges and opportunities. They select one project from those offered by sponsoring organizations and approved by the faculty members for the course. Student teams evaluate the strategic issues for their assigned clients, design a solution, and present results to an executive panel. Depending on the nature of the issue and faculty requests, team presentations of results include one or more of the following sections: 1) an analysis of the situation 2) recommendations including changes in goals and organizational design, 3) a plan of action integrating marketing, human resource development, organizational design, finance, and operations, and 4) an implementation plan using theories of communication and change management, to include the business case and a business plan. Students are expected to draw upon course work from multiple disciplines in completing this project.

Prerequisite(s): Admission to the EMBA program or permission of the program director.

Notes: Course is repeatable within the term. Offered twice in spring semester for a total of 3 credit hours.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

EMBA 751 - Corporate Strategy and Policy

Credits: 1.5 (NR)
Examines issues in strategy for firms operating in multiple markets or businesses, including diversification, portfolio approaches to corporate strategy, mergers and acquisitions, corporate alliances and joint ventures, restructuring, and coordinating multibusiness corporations.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Spring

EMBA 752 - A Strategic View of the Firm

Credits: 0-3 (NR)
Examines the interplay between the industry environment and a firm's resources and capabilities to drive superior performance. The course seeks to integrate multiple functional perspectives to arrive at a complete understanding of the firm within its
**EMBA 755 - Special Topics in Management**

Credits: 1-6 (RT)
In-depth examination of advanced topics in management.

Prerequisite(s): Admission to the EMBA program or permission of the program director.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-9
Grading: Graduate Special

**EMBA 765 - Special Topics in Management Information Systems**

Credits: 1-6 (RT)
In-depth examination of advanced topics in management information systems.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Offered on an irregular basis at the discretion of the department or school

**EMBA 775 - Special Topics in Marketing**

Credits: 1-6 (RT)
In-depth examination of advanced topics in marketing.

Prerequisite(s): Admission to EMBA program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Offered on an irregular basis at the discretion of the department or school

**EMBA 790 - National Defense Residency # 1**
EMBA 791 - The Regulatory and Business Environment of the European Union

Credits: 1.5 (NR)
Considers contemporary interactions of businesses, government, and regulation. Seminars and presentations with business, government, and regulatory officials.

Prerequisite(s): Admission to the EMBA program, or permission of the director.

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Spring

EMBA 792 - National Defense Residency 2

Credits: 1-6 (NR)
Develops National Defense perspective through seminars led by professors and high-level managers; briefings by officials of government and other policy-making organizations.

Prerequisite(s): Admission to EMBA Program or permission of the program director.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Spring

EMBA 795 - International Business Environment

Credits: 1-3 (NR)
Develops global perspective through seminars led by professors and high-level managers; briefings by officials of government and other policy-making organizations; and site visits to production and distribution facilities, research centers, IT units, and other corporate offices.

Prerequisite(s): Admission to the EMBA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Exercise, Fitness, and Health Promotion (EFHP)

Offered by the College of Education and Human Development

EFHP 500 - Workshop in Exercise, Fitness, and Health Promotion

Credits: 1-3 (RD)
Provides concentrated full-time workshops, weekend seminars, and workshops on selected topics in exercise, fitness, and health promotion.

Prerequisite(s): Graduate standing or permission of instructor

Notes: May be repeated. No more than 6 credits may be applied for degree credit.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

EFHP 522 - Anatomy for the Athletic Trainer: Structure and Function of the Neuromuscular and Musculoskeletal Systems

Credits: 3 (NR)
Promotes familiarity and proficiency with anatomy of neuromuscular and musculoskeletal systems, which relate directly to sports related injuries.

Prerequisite(s): BIOL 124 and 125 or equivalent, and permission of instructor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

EFHP 524 - Physiology for the Athletic Trainer Including the Pharmacology of Sports Injuries

Credits: 3 (NR)
Promotes familiarity and proficiency in physiology, pharmacology, and rehabilitation of sports injuries.

Prerequisite(s): BIOL 124 and 125 or equivalent, and permission of instructor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1
EFHP 526 - Athletic Training Perspectives: Evaluation and Prevention of Sports Injuries

Credits: 3 (NR)
Promotes familiarity and proficiency with assessment and physical examination of sports-related injuries.

Prerequisite(s): BIOL 124 and 125 or equivalent, and permission of instructor

Notes: Recommended that this course be taken concurrently with EFHP 522.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

EFHP 528 - Advanced Athletic Training

Credits: 3 (NR)
Promotes familiarity and proficiency with assessment and intervention of neuromusculoskeletal system and other systems of body that relate directly to sports-related injuries.

Prerequisite(s): BIOL 124 and 125 or equivalent, EFHP 526, and permission of instructor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

EFHP 598 - Special Topics

Credits: 1-6 (RT)
Focuses on projects related to exercise, fitness, or health promotion.

Prerequisite(s): Graduate standing or permission of instructor

Notes: May be repeated with no more than 6 credits earned.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EFHP 599 - Independent Study EFHP

Credits: 1-3 (RD)
Studies problem areas in exercise, fitness, and health promotion research, theory, or practice under direction of faculty member. May be repeated. No more than 3 credits may be earned.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-6
EFHP 605 - History of American Sport, Exercise, and Physical Culture

Credits: 3 (NR)
Role of sport and physical education in Europe and its impact on developments in America.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 610 - Advanced Exercise Physiology

Credits: 3 (NR)
Lecture, demonstration, and seminar experiences in applying research findings to understanding physiological function and effects of exercise on people.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 611 - Fitness Assessment: Theory and Practice

Credits: 3 (NR)
Promotes familiarity and proficiency with methods and instrumentation in assessing individual fitness and establishing base for exercise and other lifestyle alternatives to improve fitness.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

EFHP 612 - Scientific Foundation of Applied Kinesiology

Credits: 3 (NR)
An integrated study of human anatomy, physiology, chemistry, and microbiology, presenting a complete picture of how the body functions and the diseases and disorders that cause the body to malfunction.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 613 - Advanced Applied Biomechanics

Credits: 3 (NR)
Focuses on kinetic and kinematic concepts and how they apply to the qualitative and quantitative assessment of human movement. Designed for advanced study of motion analysis techniques.
Prerequisite(s): Full admission to EFHP graduate program. Introductory Biomechanics, Basic Human Anatomy, and Physics or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

EFHP 614 - Advanced Exercise Nutrition

Credits: 3 (NR)
Advanced study of nutrition's relation to physical activity, exercise, and sports. Reviews biochemical, physiological, and behavioral aspects of nutrition in promoting health, fitness, and sports performance. Focuses on nutrient needs during life cycle stages.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 615 - Epidemiology and Environmental Health

Credits: 3 (NR)
Principles, methods, and application of epidemiology. Reviews behavioral, psychological, social, and environmental risks to disease distribution. Focuses on lifestyle, exercise patterns, and environmental factors to health and disease conditions.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 616 - Motor Behavior and Development

Credits: 3 (NR)
Human motor behavior development and theory with application to evaluation of skill acquisition.

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 618 - Exercise and Sport Psychology
Credits: 3 (NR)
Covers psychological and social-psychological antecedents and consequences of exercise, physical activity, and sports participation. Emphasizes theory and research on personality, motivation, arousal, cognition, attributions, attitudes, self-efficacy, leadership effectiveness, and group dynamics.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 620 - Research Methods for Applied Kinesiology

Credits: 3 (NR)
Introduction to the techniques of research generally employed in the fields of exercise science and health.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 621 - Statistical Methods for Applied Kinesiology

Credits: 3 (NR)
Introduction to practical and applied aspects of both descriptive and applied aspects of both descriptive and inferential statistics in exercise science and health.

Prerequisite(s): Full admission to EFHP graduate program, MATH 102, STAT 250 or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 623 - Research Design and Statistical Reasoning

Credits: 3 (NR)
Introduces techniques of research and methods of data analysis.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 630 - Exercise, Health, and Fitness Program Development

Credits: 3 (NR)
Covers exercise and health program development related to fitness and health of adult populations.
Prerequisite(s): Graduate standing or permission of instructor.

Notes: Provides 3 to 6 hours of field experience.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EFHP 650 - Scientific Principles of Motor Learning**

Credits: 3 (NR)  
Biomechanical analysis and application of scientific principles of movement to instructing sport skills in physical education and sport programs.

Prerequisite(s): Graduate standing or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EFHP 660 - Management of Exercise, Fitness, and Health Promotion Organizations**

Credits: 3 (NR)  
Advanced study in management and administration of organizations dedicated to human development and improvement of quality of life. Covers application of theories and practices of management and behavioral sciences, fiscal management, marketing, and evaluation research.

Prerequisite(s): Graduate standing or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EFHP 670 - Analysis of Teaching in Physical Education**

Credits: 3 (NR)  
Presents qualitative and quantitative research methods for studying teacher and student behaviors in physical education setting, and engaging teacher as researcher. Revisits teaching strategies, develops action research projects, and examines current education reform movements.

Prerequisite(s): Graduate standing or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EFHP 671 - Teaching PHED in Secondary School**
Advanced study of methods, materials, content and organization of physical education programs. Emphasis on curriculum planning, current methodologies, and trends.

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 680 - Ethical Issues in Exercise, Fitness, and Health Promotion

Credits: 3 (NR)
Covers formulation of coherent framework for ascertaining good, right, and just; and for assessing evidence and reason underlying positions and arguments. Examines ethical issues in exercise, fitness, and health promotion.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EFHP 690 - Scientific Communications

Credits: 3 (NR)
Studies and applies written and verbal communication skills in reading, analyzing, writing, and distributing scientific information in Applied Kinesiology.

Prerequisite(s): EFHP 612, EFHP 620, EFHP 621, or Permission of Instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

EFHP 798 - Project

Credits: 1-3 (RD)
Addresses an applied exercise, fitness, and health promotion issue under supervision of graduate faculty member.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EFHP 799 - Thesis
Credits: 1-6 (RD)
Explores exercise, fitness, and health promotion problem using appropriate research methodology and under supervision of graduate faculty member.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

EFHP 802 - Readings for the Doctor of Arts in Community College Education

Credits: 3-9 (RD)
Intensive reading in recent scholarship in physical education and related fields. Students must propose reading list that must be approved by faculty advisor and use list to prepare potentially publishable literature review.

Prerequisite(s): Graduate standing or permission of instructor

Hours of Lecture or Seminar per week: 3-9
Hours of Lab or Studio per week: 0
Grading: Graduate Special

Film and Video Studies (FAVS)

Offered by the College of Visual and Performing Arts

FAVS 100 - Film and Video Studies Colloquium

Credits: 1 (RD)
Students are exposed to the film and video industry through film professionals. Students are required to attend all sessions, review the speaker's materials prior to the class, prepare questions, and complete written critiques. FAVS majors are required to take FAVS 100 twice.

Prerequisite(s): FAVS majors only.

Notes: Students may repeat for a total of 5 credits but only 2 credits of C or better may be applied to the degree.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2
When Offered: Fall, Summer, Spring

FAVS 225 - The History of World Cinema

Credits: 3 (NR)
This course is a survey of the history of cinema. It explores the development of world cinema from its beginnings in the late
nineteenth century to the 1990s. The course will enable students to comprehend the evolution of the history and language of
cinema in order to connect the art of filmmaking with the "outside forces" (i.e., the economic institutions, key figures, historical
events and social issues) that profoundly shape and influence it.

Fulfills general education requirement in Arts.

Hours of Lecture or Seminar per week: 3
When Offered: Fall, Summer, Spring

FAVS 335 - Sound and Lighting for Film and Video

Credits: 3 (NR)
This course will instruct students on the theories, techniques, and technologies pertaining to recording audio and lighting scenes
in both field and studio video productions. The course will be lecture based with practical lab styled exercises reinforcing topics
presented during lecture.

Prerequisite(s): COMM 355 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

FAVS 352 - Ethics of Film and Video

Credits: 3 (NR)
An examination of ethical issues associated with image production and consumption. Topics include the technological
development of the film apparatus, privacy, the pursuit of objectivity, excess, consent, and representing others. All issues
highlight the increasingly sophisticated and powerful role of film and media authorship. Students will develop a more complex
view of the ethics of screen representation (both fiction and nonfiction) and be encouraged to take stock of the ethics of their own
media literacy.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses and completion of 21
credits within the FAVS program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FAVS 355 - Film Business Practices

Credits: 3 (NR)
An overview of the film industry from a business perspective. Students learn basic business practices, film financing, business
plans, film distribution, and management and marketing techniques appropriate for the film industry.

Prerequisite(s): COMM 454 or FAVS 352.
FAVS 365 - Documentary Filmmaking I

Credits: 3 (NR)
An introduction to documentary filmmaking in which each student makes a short digital documentary, from concept development to finished piece. The class covers essential technical skills, emerging styles of nonfiction film, and documentary storytelling techniques.

Prerequisite(s): Satisfactory completion of COMM 355.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FAVS 399 - Special Topics in Film and Video Studies

Credits: 1-3 (RT)
In-depth presentation and exploration of topical studies.

Notes: Subject matter varies. May be repeated for a maximum 12 credits when taken under different topics.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

FAVS 450 - Internship in Film and Video Studies

Credits: 3 (RD)
On-the-job training in film and video studies through approved fieldwork study programs. Internships are arranged and supervised by the FAVS director.

Prerequisite(s): 75 credits, 15 credits in core/elective FAVS courses, and permission of the Internship Coordinator.

Notes: Required for all FAVS majors.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

FAVS 460 - Advanced Video Editing

Credits: 3 (NR)
This course will instruct students on the theories, techniques and technologies pertaining to video editing for fiction and documentary films, as well as commercials. The course will combine lectures, discussions, and demonstrations with hands on
FAVS 483 - Feature-Length Scriptwriting

Credits: 3 (NR)
This course is an introduction to the development and analysis of feature length screenplays. The approach combines lecture, discussion, screening and presentation of student work. By the end of the semester, each student should have a complete first draft of an original screenplay. Students will also complete story reports/coverage reports of screenplays by other writers.

Prerequisite(s): THR 482 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

FAVS 490 - Independent Study

Credits: 1-6 (RD)
Independent research on specific project under direction of selected faculty member.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall

FAVS 498 - Creative Producing and Development

Credits: 3 (NR)
An introduction to the creative process of researching and developing material for film and video for senior projects. The course examines evaluating and developing existing literary material, documentary work, and/or fictional material.

Prerequisite(s): Senior status in the FAVS program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.
Credits: 3 (NR)
Culminating seminar devoted to analyzing and synthesizing knowledge and skills gained through undergraduate course work as it applies to film, video studies, and professional development.

Prerequisite(s): FAVS 498.

Notes: Students will be required to develop and present written materials and documentation related to the development and presentation of their works, as well as present their work in FAVS 100 Film and Video Studies Colloquium as part of their formal oral presentation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FAVS 550 - Internship

Credits: 3 (RD)
On-the-job training in film and video studies through approved fieldwork study programs. Internships are arranged and supervised by the FAVS director.

Prerequisite(s): Permission of the Internship Coordinator.

When Offered: Fall, Summer, Spring.

FAVS 570 - Screenwriting

Credits: 3 (NR)
Screenwriting course emphasizing student development in screenplay form, structure, and storytelling with emphasis on craft, character, and story culminating in a screenplay.

Prerequisite(s): Undergraduate degree or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

FAVS 590 - Independent Study

Credits: 1-6 (RD)
Independent research on specific project under direction of selected faculty member.

Prerequisite(s): Undergraduate degree or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.
FAVS 597 - Independent Production

Credits: 1-3 (RD)
Media or creative production activities under direction of faculty member. Requires completed production; written report, oral exam may be required.

Prerequisite(s): Permission from department.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

FAVS 599 - Special Topics

Credits: 1-6 (RD)
In-depth presentation and exploration of topical studies.

Prerequisite(s): Undergraduate degree or equivalent, or permission of instructor.

Notes: Subject matter varies. May be repeated for a maximum 9 credits when taken under different topics.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

Finance (FNAN)

Offered by the School of Management

If a student takes noncore, upper-level business courses before admission to SOM, those courses will not count on an undergraduate degree application for any major in the school, except as general elective credit. A grade of C or higher must be presented on the graduation application for each upper-level course in the major. Course prerequisites are strictly enforced. Degree status is defined as formal admission to BS degree status in SOM.

FNAN 300 - Personal Financial Management

Credits: 3 (NR)
Emphasis is on understanding the importance of developing financial goals and how financial decisions affect those goals throughout their lifetime. In addition, students will develop their own financial goals along with a financial plan that would enable them to meet those goals. This course may be taken for regular grading or S/NC. Students must notify instructor which option they want. FNAN 300 may be taken for general elective credit by School of Management students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Special undergraduate.
When Offered: Fall, Spring
FNAN 301 - Financial Management

Credits: 3 (NR)

Introduction to managing a firm's financial resources given wealth maximization decision criterion. Includes working capital management, fixed-asset investment, cost of capital, capital structure, and dividend decision analysis. School of Management students will not be permitted to make more than three attempts to achieve a C or higher in FNAN 301. Those who do not successfully complete this course within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

Prerequisite(s): C or better in ECON 103, ACCT 203, and OM 210; sophomore standing. Prerequisite enforced by registration system.

Notes: Lecture, problems, and discussion. Requires attendance in weekly lectures and recitations. The final exam for FNAN 301 may be scheduled to take place for all sections at the same time during the final exam period. Accommodations will be made for exam and religious conflicts and for certain official university-sponsored activities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

FNAN 302 - Financial Analysis, Forecasting, and Valuation

Credits: 3 (NR)

Examines techniques for analyzing, understanding, and applying financial information in decision situations. Topics include financial statement analysis, development of financial models, and financial planning and forecasting.

Prerequisite(s): Degree Status and a grade of B minus or higher in FNAN 301. Prerequisite enforced by registration system.

Notes: Lecture, discussion, computer-assisted research.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

FNAN 311 - Principles of Investment

Credits: 3 (NR)

Introduces analysis of the valuation of equity and debt securities given modern capital market theory. Includes discussion of portfolio analysis as related to valuation of securities.

Prerequisite(s): Degree Status and a grade of B minus or higher in FNAN 301. Prerequisite enforced by registration system.

Notes: Lecture, discussion, and computer-assisted research.
FNAN 321 - Financial Institutions

Credits: 3 (NR)
Discusses basic objectives of financial institutions in light of industry structure and regulatory environment, and decision variables that management should concentrate on to achieve objectives. Includes role of financial institutions in allocation of funds in financial markets.

Prerequisite(s): Degree Status and a grade of B minus or higher in FNAN 301. Prerequisite enforced by registration system.

Notes: Lecture, discussion, and computer-assisted research.

FNAN 351 - Principles of Real Estate

Credits: 3 (NR)
Studies dimensions and specialties involved in public control and private development, sale, finance, and management of real estate. Includes land planning, land-use control, appraisal, finance, brokerage, property management, and investment.

Prerequisite(s): C or higher in FNAN 301, degree status. Prerequisite enforced by registration system.

Notes: Lecture, discussion, and computer-assisted research.

FNAN 401 - Advanced Financial Management

Credits: 3 (NR)
Analyzes decision-making in firm, emphasizing conceptual structure of problems and using advanced analytic techniques. Topics include current asset management, capital budgeting and structure, dividend policy, long-term financing, mergers, and corporate planning models.

Prerequisite(s): Degree Status and a grade of B minus or higher in FNAN 301. Prerequisite enforced by registration system.

Notes: Lecture, discussion, and case analysis.
FNAN 411 - Investment Analysis and Portfolio Management

Credits: 3 (NR)
Analyzes modern techniques of portfolio management including evaluating standards for selecting individual securities to include or delete from portfolios. Presents risk-return analysis for portfolios and portfolio performance measures. Lecture, discussion, computer assisted research.

Prerequisite(s): Degree Status and a grade of C or higher in FNAN 311. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

FNAN 412 - Futures and Options Markets

Credits: 3 (NR)
Introduces options, commodity, and financial futures markets as they function to provide pricing mechanisms and alternative investment vehicles. Lecture, discussion, and computer-assisted research.

Prerequisite(s): Degree Status and a grade of C or higher in FNAN 311. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

FNAN 421 - Money and Capital Markets

Credits: 3 (NR)
Discussion of how financial markets are organized, their role in the allocation of funds to various market segments, and interaction between markets. Topics include aggregate flow of funds analysis; and money, government, corporate, and mortgage markets. Lecture, discussion, and computer assisted research.

Prerequisite(s): Degree Status and a grade of C or higher in FNAN 321. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

FNAN 430 - Empirical Methods in Finance

Credits: 3 (NR)
Examines statistical and econometric techniques used in analyzing financial data and developing financial models. Combines development of understanding of fundamental concepts with applications. Includes extensive use of standard software.
Prerequisite(s): C or higher in FNAN 311 or FNAN 321; BS degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

FNAN 432 - Fixed-Income Securities

Credits: 3 (NR)
Focuses on analysis of fixed-income securities, including corporate and government bonds, mortgage-backed securities, and derivatives. Major topics include institutional features of fixed-income securities markets, valuation, analysis of risks, and portfolio management decisions.

Prerequisite(s): C or higher in FNAN 311; BS degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

FNAN 440 - International Financial Management

Credits: 3 (NR)
Introduces management of contemporary firm's international financial operations. Topics include foreign exchange risk, political risk, returns and risks of international projects, international money and capital markets, financial accounting, capital structure, and cost of capital. Lecture, discussion, readings, and problems.

Prerequisite(s): Degree Status and a grade of C or higher in FNAN 311. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

FNAN 451 - Real Estate Finance

Credits: 3 (NR)
Studies mechanisms of real estate finance, sources of funds, loan contracts, principles of mortgage risk analysis, and secondary mortgage markets. Develops analytical skills including using microcomputer and appropriate software.

Prerequisite(s): C or higher in FNAN 351, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

FNAN 454 - Real Estate Development
Examines commercial real estate development process and principles plus actual residential, office, retail, and industrial projects. Includes financial analytical techniques to investigate project feasibility, density, financing viability, cash flows, and valuation. Emphasis placed on real-world, entrepreneurial, decision-making skills for developing commercial real estate. Lecture, discussion, project analysis.

Prerequisite(s): C or higher in FNAN 351, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

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FNAN 462 - Honors Seminar in Finance

Credits: 3 (NR)
Provides an in-depth study and analysis of contemporary developments and topics of interest in finance. Topics and format will vary. Enrollment is limited and competitive.

Prerequisite(s): Finance major, degree status, senior standing, permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

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FNAN 491 - Special Topics in Finance

Credits: 3 (NR)
Advanced study of special topics in finance.

Prerequisite(s): C or higher in FNAN 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

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FNAN 499 - Independent Study

Credits: 1-3 (RT)
May be repeated to a maximum of 6 credits if topics vary. Degree status. Research and analysis of selected problems or topics in finance.

Prerequisite(s): Finance majors with at least 9 upper-level credits, degree status.

Notes: Must be arranged with instructor and approved in writing by associate dean for undergraduate programs before registration. Written report required. May be repeated for maximum 6 credits if topics vary.
Foreign Languages (FRLN)

Offered by the College of Humanities and Social Sciences

FRLN 310 - Outside of Hitler's Shadow: Germany in its Global Context

Credits: 3 (NR)
Critical examination of images of Nazis, Hitler, and Holocaust in media, popular culture. Course seeks to demystify and de glamorize such images while highlighting philosophical, cultural, and scientific contributions of Germany, Austria, and Switzerland.

Prerequisite(s): Completion of concurrent enrollment in all other general education courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 330 - Topics in World Literature

Credits: 3 (RT)
Major works of world literature with varying perspectives and topics, such as specific cultures, histories, myths, or music and the arts, as represented in literature.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 and 45 credits, or permission of instructor.

Notes: Taught in English. May be repeated for a maximum of 9 credits when topic differs with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 331 - Topics in World Cinema

Credits: 3 (RD)
Major works of world cinema with varying perspectives and topics, such as specific genres, periods, schools.

Prerequisite(s): English 101 or permission of instructor.

Notes: Course work in English. May be repeated for a maximum of 9 credits when topic is different with permission of department.
FRLN 380 - Topics in the Sociopolitics of Language

Credits: 3 (RD)
Addresses relationship between language and other social and cultural systems (macro sociolinguistics), and critical study of people's ideas about language (language ideology). Utilizes comparative approach to explore ways people use language to perform and communicate various social identities and categories; how and why people attach social meanings and values to particular ways of using language; development of official and unofficial language policies; and impact of language policies.

Prerequisite(s): ENGL 101/ENGH 101 and 45 credits, or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

FRLN 385 - Multilingualism, Identity, and Power

Credits: 3 (NR)
Study of individual and societal aspects of multilingualism including language choice, linguistic maintenance and shift, code-switching, language planning, educational policy, and representations of multilingualism. Interdisciplinary approach emphasizes the social and political aspects of multilingualism, as well as the relationship of language to cultural, ethnoracial, and national identities and categories.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses.

FRLN 430 - Topics in Comparative World Literatures

Credits: 3 (RD)
Explores comparative studies of a topic through literary works written in at least two different languages. All material provided in translation.

FRLN 431 - Medieval Intellectual Topics

Credits: 3 (NR)
Focuses on topic in intellectual history of Middle Ages. Emphasizes literary or historical, depending on discipline of instructor. Relevant material may be drawn from philosophy, theology, and art.
Equivalent to ENGH 421/HIST 431, ENGL 431 (2010-2011 Catalog)

Notes: May be taken for credit by English or history majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 510 - Bibliography and Research in Foreign Languages and Literature

Credits: 3 (NR)
Use of basic bibliographical tools and methodologies for scholarly research in French, German, and Spanish. Taught in cooperation with university library staff.

Prerequisite(s): Graduate standing or permission of department.

Notes: Conducted in English.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 525 - Literary Translation

Credits: 3 (NR)
Critical approach and analysis of diverse texts such as poetry, drama, essay, and novel excerpts.

Prerequisite(s): Graduate standing or permission of department and advanced coursework in literary translation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 550 - Special Topics

Credits: 3 (RT)
Themes, periods, or genres vary from semester to semester. Focuses on topics that incorporate one or more languages taught in department, but instruction is in English.

Notes: May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 551 - Special Topics
Themes, periods, or genres vary from semester to semester. Focuses on topics that incorporate one or more languages taught in department, but instruction is in English.

Notes: May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 565 - Theory of Translation

Credits: 3 (NR)
Lectures on nature, function of translating process. Evaluates theories of translation with respect to text typology. Critiques selected translations from target languages to English and vice versa.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 572 - Integrating Technology into Language Learning

Credits: 3 (NR)
Explores pedagogical and theoretical basis for integrating interactive technologies into language learning programs, and examines potential for learning, teaching, testing, and research. Includes hands-on analysis and evaluation of materials.

Prerequisite(s): Graduate standing or permission of department, language teaching methods course, and language teaching experience.

Notes: Prior experience with technology not required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 573 - Basic Issues in Language Pedagogy

Credits: 3 (NR)
Explores major issues controversial in language pedagogy. Topics include communicative competence as pedagogical goal, role of explicit grammar teaching, proficiency movement, cultural authenticity, student-centered learning, and technology.

Prerequisite(s): Graduate standing or permission of department, language teaching methods course, and language teaching experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 590 - Internship and Seminar in Translation
Credits: 3 (NR)
Internships are nonpaying, work-study positions that focus on the practice of translation. Qualified students placed with area institutions, interest groups, agencies, or corporations.

Prerequisite(s): Admission to translation certificate program.

Notes: Placement depends on availability of positions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 600 - Workshop in Foreign Languages

Credits: 1-6 (RT)
In-service workshops, tours, and seminars on selected topics in literature, language, bilingualism, culture, methodology.

Notes: May not be applied toward MA in foreign languages without permission of department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-12

FRLN 620 - Literary Theory and Criticism

Credits: 3 (NR)
Studies nature of literary work, and analyzes contemporary critical approaches to literature.

Notes: May not be taken for credit by students who previously received credit for FRLN 615.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 650 - The Teaching of Culture in Foreign Language Programs

Credits: 3 (NR)
Purpose and methods of study of culture, with emphasis on strategies and techniques for teaching culture in foreign language programs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRLN 660 - Approaches to the Study of Language

Credits: 3 (NR)
Linguistics and its relationship to other disciplines, including study of generative grammar with syntactic problems drawn from
commonly taught foreign languages.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**FRLN 670 - Foreign Language Learning and Teaching**

Credits: 3 (NR)  
Theories, methods, and strategies of second and foreign language learning and teaching.

**Notes:** May not be taken by students who have completed FRLN 570.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**Forensics (FRSC)**

Offered by the College of Science

**FRSC 200 - Survey of Forensic Science**

Credits: 3 (NR)  
This course will familiarize students with the basic principles and uses of forensic science in the American system of justice. This course will review the basic applications of biological, physical, chemical, medical and behavioral sciences to questions of evidence and law. In doing so, students should gain a basic understanding of the capabilities and limitations of the forensic sciences as they are practiced.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**FRSC 201 - Introduction to Criminalistics**

Credits: 3 (NR)  
An overview of the field of criminalistics, with a focus on the recognition, collection, preservation, and analysis of physical evidence. An introduction to topics such as fingerprints examination, trace evidence analysis, and to prepare students for additional, more in-depth classes in criminalistics/forensic science.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**FRSC 302 - Forensic Bio-Trace**
This course will familiarize students with an overview of the field of forensic science, including areas of trace and biological evidence. Various topics address the analysis of blood and physiological fluid identification, typing, reporting results, and expert testimony.

Prerequisite(s): Admitted to Forensic Science Program FRSC 200, FRSC 201, BIOL 213.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

FRSC 303 - Forensic Evidence and Ethics

Credits: 3 (NR)
This course will acquaint the student with the application of scientific methods and the interaction it may have with legal principles. It will prepare, in a broad sense, the student for future applications of forensic science with its role in the administration of justice, and the ethical rules and duties under codes of professional conduct.

Prerequisite(s): Admitted to Forensic Science Program, FRSC 200, and CRIM 100; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

FRSC 304 - Forensic Chemistry and Microscopy

Credits: 3 (NR)
Introduction to the theme of forensic science in its application to the fundamentals of chemistry exposing students to widely used concepts of toxicology and arson investigation. An introduction to microscopy helps students master the foundational principles of microscopy in analyzing forensic trace evidence.

Prerequisite(s): Admitted to Forensic Science Program, CHEM 211, and CHEM 212; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

FRSC 405 - Independent Studies / Research

Credits: 3 (NR)
Independent Studies / Research. Creative projects, including research and design, which are supervised on an individual basis and which fall outside the scope of formal courses.

Prerequisite(s): Admitted to Forensic Science Program and 90 hours, or permission of instructor.

Hours of Lecture or Seminar per week: 3
FRSC 415 - Selected Topics in Forensic Science

Credits: 3 (RD)
Topics vary according to instructor's specialty.

Prerequisite(s): Permission of instructor

Notes: May be repeated only with permission of program chair.

FRSC 420 - Forensic Toxicology

Credits: 3 (NR)
Examines toxic substances and their effects on human cellular and organ systems. The course focuses on human physiological concepts, the human enzymatic detoxification processes, methodologies for identifying toxins, and specific toxic analytes.

Prerequisite(s): Completion of forensic science foundation courses

FRSC 440 - Forensic Chemistry

Credits: 3 (NR)
The principles of forensic chemistry will be addressed in this course, including analytical chemistry, instrumentation, sample handling, drug chemistry and pharmacology, and analysis of physical evidence such as papers, inks, paints, and coatings.

Prerequisite(s): Completion of forensic science foundation courses

FRSC 460 - Forensic DNA Sciences

Credits: 3 (NR)
Presentation of the general principles and methodologies used in forensic DNA profiling. Topics include the development of DNA profiling methods, current DNA typing techniques, forensic DNA and paternity-related issues, and legal issues associated with quality control, frequency estimates, sample conditions, chain of custody, and admissibility.
Prerequisite(s): Completion of forensic science foundation courses

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 500 - Introduction to Forensic Science

Credits: 3 (NR)
Overview of forensic science and related investigative techniques. Includes coverage of crime scene investigation, crime scene procedures, the role of the forensic pathologist, the modern forensic laboratory, DNA analysis techniques, microanalysis, examination of trace evidence, hair and fibers, examination of questioned documents, forensic anthropology, forensic odontology, homicide investigation, and analysis of a mock crime scene.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 510 - Basic Crime Analysis

Credits: 3 (NR)
Examines the role of the first officer at the scene, search, seizure and related legal issues, traditional crime scene measurements, photogrammetry, processing latents, crime scene reconstruction methods, 2-D and 3-D impressions, blood spatter analysis, collection of trace evidence, packaging and preserving evidence, outdoor crime scenes, and explosion and fire scenes.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 511 - Advanced Crime Scene Analysis

Credits: 3 (NR)
Advanced Crime Scene Analysis is designed to build on concepts introduced in FRSC 510 (Basic Crime Scene Analysis), and to provide an enhanced foundation in the field of criminalistics for those students who are interested in learning the application of science to solving crimes.

Prerequisite(s): FRSC 510 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

FRSC 512 - Physical Evidence Analysis
Credits: 3 (NR)
This is a series of practical laboratory exercises that introduces the student to sophisticated crime scene documentation techniques including collection of evidence, examination of hairs, fibers, toolmarks and other trace evidence. Advanced topics in blood spatter, trajectory, pattern casting, and alternate light sources will be explored.

Prerequisite(s): FRSC 510 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

FRSC 513 - Forensic Photography

Credits: 3 (NR)
This series of lecture and practical exercises introduces the student to sophisticated crime scene documentation techniques including photography, digital imaging, use of lighting, and legal issues relating to images.

Prerequisite(s): Admitted to the Forensic Science Master’s Program, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

FRSC 515 - Selected Topics in Forensic Science

Credits: 3 (RD)
Topics vary with instructor's specialty. May be repeated only with permission of program chair.

Prerequisite(s): Permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 520 - Toxicology

Credits: 3 (NR)
Examines toxic substances and their effects on human cellular and organ systems. The course focuses on human physiological concepts, the chemistry of toxins, the human enzymatic detoxification processes, and the analytical techniques required for detecting the presence of toxins and their metabolites in human tissue or serum.

Prerequisite(s): Advanced level undergraduate course in molecular or cellular biology, biochemistry or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
FRSC 530 - Law and Forensic Science

Credits: 3 (NR)
A detailed examination and analysis of the law affecting forensic science across the discipline range. Special emphasis is given to the laws affecting evidence, courtroom procedure, and the forensic expert.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 540 - Forensic Chemistry

Credits: 3 (NR)
The principles of forensic chemistry will be addressed in this course, including analytical chemistry, instrumentation, sample handling, drug chemistry and pharmacology, and analysis of physical evidence such as papers, inks, paints, and coatings.

Prerequisite(s): Undergraduate degree in chemistry or biology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 550 - Issues in Forensic Anthropology

Credits: 3 (NR)
Examines issues related to skeletal analyses and interpretation of forensic case reports in determining personal identification and cause of death. Discussions include skeletal variation, age criteria, sexing criteria, pathology, trauma, and postmortem damage.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 560 - Forensic DNA Sciences

Credits: 3 (NR)
Intensive introduction to parameters affecting data QC and analysis, including factors arising from biochemistry, chemistry, genetics, statistics, instrumentation, and software.

Equivalent to BINF 637

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
FRSC 570 - Introduction to Biochemical Forensics

Credits: 3 (NR)
An introduction to biochemical forensics for non-scientists. This class will first lay a basic groundwork in chemistry and biochemistry. This background will be used in the explanation of forensic toxicology, DNA and blood analysis, identification of bodily fluids and stains, and analysis of controlled substances.

Prerequisite(s): A course in introductory biology or chemistry, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 580 - Image Analysis in Forensic Science

Credits: 3 (NR)
This course begins with an introduction to digital images, formats, and some pertinent processing techniques. Methods presented will include image enhancement, noise removal and frequency processing. The course will then explore modern techniques applied to several fields including: fingerprints, face images, tire treads, shoe prints, and other applications. Advanced topics in 3D imagery, tampering, and steganography will be explored.

Prerequisite(s): CDS 130 (or equivalent), MATH 111 (or equivalent), or instructor’s approval.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer

FRSC 600 - Forensics Seminar

Credits: 1 (RD)
Selected topics in forensic science research, generally consisting of research presentations by forensic professionals and faculty members. Students must write up a one page summary of each talk attended.

Prerequisite(s): Admission to the Forensic Science MS program.

Notes: Students enrolled in the forensic science MS program must attend at least 80% of the seminars. May be repeated for a total of 3 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

FRSC 610 - Forensics Research Project

Credits: 1-3 (RD)
Research project in a current area of forensic science performed under the direction of a faculty member or affiliated forensic science professional.
Prerequisite(s): Admission to Forensic Science MS program.

Notes: May be repeated for a total of 3 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

FRSC 690 - Forensics Capstone Course

Credits: 3 (NR)
Integrates all the various techniques used in the study of forensic science and medicine, and applies them to the interpretation of facts and the reconstruction of the sequence of events at a variety of typical death scenes. Integrates medical, scientific, sociological, and legal methodology as they apply to medicolegal death investigations, using a variety of forensic literature and text resources. Presents an integrative approach to crime scene analysis based on actual case studies, in which students apply theoretical concepts discussed in class to real-world situations. Includes weekly group projects, with students organized in rotating groups and assigned a research topic in forensic medicine. Students discuss, examine, and analyze forensic, medical, and physical elements present at the death scenes, and develop their own hypotheses, which are then evaluated and discussed as the case is reconstructed.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FRSC 790 - Internship in Forensic Science

Credits: 1-3 (RD)
On the job experience for Forensic Science majors in industry or government laboratories or investigative units, or approved study programs with specific employers. Students work in observational, experimental, or theoretical research, and prepare weekly journals, as well as a written report at the end of the internship.

Prerequisite(s): Admitted to Forensic Science Program, or permission of instructor. See department for requirements and application procedures prior to enrollment.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

FRSC 799 - Master's Thesis

Credits: 1-6 (RD)
Project chosen and completed under guidance of graduate faculty member. Comprehensive report (thesis) acceptable to student's advisory committee is required.

Prerequisite(s): Permission of forensic science MS program director.

Hours of Lecture or Seminar per week: 1-3
French (FREN)

Offered by the College of Humanities and Social Sciences

Placement: See Academic Testing section of the Admission chapter.

See also FRLN course listings.

FREN 101 - Elementary French I

Credits: 3 (NR)
For students with no knowledge of French. Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Students may not receive credit for FREN 101 and FREN 105, 109, or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 102 - Elementary French II

Credits: 3 (NR)
Continuation of FREN 101.

Prerequisite(s): FREN 101, appropriate placement score, or permission of instructor.

Notes: Students may not receive credit for FREN 102 and FREN 105, 109, or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 109 - Intensive Elementary French

Credits: 6 (NR)
Equivalent to FREN 101 and 102 taught in single semester.

Notes: Recommended for students who desire intensive introduction. Students may not receive credit for FREN 109 and FREN 101, 102, 105 or 110.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 2
FREN 110 - Elementary French

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Students may not receive credit for FREN 110 and FREN 101, 102, 105, or 109.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

FREN 115 - Review of Elementary French

Credits: 3 (NR)
Reviews elements of French for students who have studied French previously.

Prerequisite(s): Appropriate placement score or permission of the department.

Notes: Students may not receive credit for FREN 115 and also FREN 105, 102, 109 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 201 - Intermediate French I

Credits: 3 (NR)
Further development of skills in listening, speaking, reading, and writing.

Prerequisite(s): FREN 102, 105, and 109; appropriate placement score; or permission of department.

Notes: FREN 201 and 202 must be taken in sequence. Students may not receive credit for FREN 201 and FREN 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 202 - Intermediate French II

Credits: 3 (NR)
Applies language skills to reading, composition, and class discussion.

Prerequisite(s): FREN 201, appropriate placement score, or permission of department.

Notes: Students may not receive credit for FREN 202 and FREN 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
FREN 209 - Intensive Intermediate French

Credits: 6 (NR)
Equivalent to FREN 201 and 202 taught in single semester.

Prerequisite(s): FREN 102, 105, and 109; appropriate placement score; or permission of department.

Notes: Students may not receive credit for FREN 209 and FREN 201, 202, or 210.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

FREN 210 - Intermediate French

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of French-speaking regions.

Prerequisite(s): FREN 110 or appropriate placement score.

Notes: Students may not receive credit for FREN 210 and FREN 201, 202, or 209.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 250 - Gateway to Advanced French

Credits: 3 (NR)
Integration of advanced intermediate-level French reading, writing, listening, and speaking skills, and the development of critical thinking about authentic texts from around the globe.

Prerequisite(s): FREN 210, appropriate placement score, or permission of department.

Notes: Taught in French.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 300 - Study Tour in France

Credits: 1-6 (NR)
Directed study tour of cultural and literary points of interest in France. Briefing sessions and reading selection given before the trip.

Prerequisite(s): FREN 250, appropriate placement score or permission of instructor.
Notes: All papers and exams required for credit are due by end of summer session.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-12

FREN 309 - Reading and Writing Skills Development

Credits: 6 (NR)
Development of ability to write on topics of current interest. Readings provide examples of each topic and necessary vocabulary for compositions. Introduces reading strategies and provides practice in reading of different kinds of texts.

Fulfills writing intensive requirement in the major.

Prerequisite(s): FREN 202, 250, or equivalent; appropriate placement score; or permission of instructor.

Notes: Taught in French.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

FREN 310 - Oral Proficiency in French

Credits: 3 (NR)
Develops conversational proficiency in French with attention to various specific communicative strategies and functions. Practice in pronunciation and diction based on systematic study of sound system of French.

Prerequisite(s): FREN 250, appropriate placement score or permission of instructor.

Notes: Taught in French.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 320 - Contemporary Tour de France

Credits: 3 (NR)
Examines contemporary social, political, economic, cultural trends in France. Covers domestic and international topics such as debates around French identity, migration and civil rights, political parties, the media, family life, work-related issues, participation in international organizations and involvement with former colonies and overseas regions.

Prerequisite(s): FREN 309 or permission of the instructor.

Notes: Taught in French.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
FREN 325 - Major French Writers

Credits: 3 (NR)
Studies works of major French writers. Writers to be studied vary.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Taught in English. May be repeated for credit with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 329 - Problems of Western Civilization in French Literature

Credits: 3 (NR)
Basic philosophical, moral, social, and political dilemmas reflected in literature of major French writers.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Taught in English. May be repeated for credit with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 340 - Francophone Identities

Credits: 3 (NR)
Provides opportunity to learn about richness, variety, and complexity of francophone world through study of literature, culture, social life, and identities of various francophone regions including Caribbean, Africa, Quebec, and Indochina.

Prerequisite(s): FREN 309, appropriate placement score, or permission of instructor.

Notes: Taught in French.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 357 - Introduction to Translation
French to English, English to French translations, of texts from current periodicals and newspapers in various fields.

**Prerequisite(s):** FREN 250, appropriate placement score or permission of instructor.

**Notes:** Recommended for students who wish to improve language skills.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### FREN 370 - French Civilization, Culture, and Literature: Ancient Gaul to 1789

Credits: 3 (NR)  
Examines history, civilization (daily life, politics, science, philosophy, religion), culture (architecture, art, music, dance), and literature of France from Ancient Gaul to the eve of the French Revolution. Studies development of French nation and its people through written texts, visual arts, and music.

**Prerequisite(s):** FREN 309, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### FREN 371 - French Civilization, Culture, and Literature: 1789 to the Present

Credits: 3 (NR)  
Examines history, civilization (daily life, politics, science, philosophy, religion), culture (architecture, art, music, dance), and literature of France from French Revolution of 1789 to present. Studies development of French nation and its people through written texts, visual arts, and music.

**Prerequisite(s):** FREN 309, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### FREN 381 - Introduction to Literary Analysis

Credits: 3 (NR)  
Structured approach to reading and analysis of French literary texts.

**Prerequisite(s):** 15 credits of French.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### FREN 391 - French for the Business World
Credits: 3 (NR)
Studies styles in commercial, private, and official formats for correspondence and various common business documents. Emphasizes written exercises. Satisfies needs of students equipping themselves for multinational business and foreign service.

Prerequisite(s): 15 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 400 - Study Abroad in France or Francophone Region

Credits: 1-6 (RD)
2 to 4 week programs in France or the Francophone world with language, culture and literature courses, local visits and excursions.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

FREN 415 - Topics in Medieval French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (chanson, novel, poetry, short story) and authors in their historical and cultural contexts: geste, feudalism, socio-political and religious (in)stability.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 416 - Topics in Renaissance French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and theater) and authors in their historical and cultural contexts: humanism, reformation, codification of language and birth of nation-state.

Equivalent to FREN 405 (2011-2012 Catalog)

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
FREN 417 - Topics in Seventeenth-Century French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and theater) and authors in their historical and cultural contexts: baroque, classicism, social and philosophical essays, satirical plays.

Equivalent to FREN 413 (2011-2012 Catalog), FREN 414 (2011-2012 Catalog).

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 418 - Topics in Eighteenth-Century French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and theater) and authors in their historical and cultural contexts: enlightenment, social, political and philosophical trends and issues, pre-romanticism.

Equivalent to FREN 421 (2011-2012 Catalog), FREN 422 (2011-2012 Catalog).

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 419 - Topics in Nineteenth-Century French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and theater) and authors in their historical and cultural contexts: pre-Romanticism; Romanticism; Realism; Symbolism; Naturalism.

Equivalent to FREN 431 (2011-2012 Catalog), FREN 432 (2011-2012 Catalog).

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
FREN 420 - Topics in Twentieth and Twenty-First-Century French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and theater) and authors in their historical and cultural contexts: surrealists, existentialists, new novelists, feminists, etc.

Equivalent to FREN 441 (2011-2012 Catalog), FREN 442 (2011-2012 Catalog).

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 450 - Special Topics Related to French Literature and Culture

Credits: 3 (RD)
Analyzes selected texts, authors, movements, and issues within a comparative historical and cultural context over two or more centuries or with an interdisciplinary approach.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 451 - Topics in Sub-Saharan Francophone Literature and Culture

Credits: 3 (RD)
Analyzes a selection of literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: Négritude, (post)colonialism, new African voices within and beyond the continent.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 453 - Topics in North African Francophone Literature and Culture
Credits: 3 (RD)
Analyzes a selection of literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts with a focus on the construction of identity: Maghreb in pre and (post)colonial era, recent ideological trends in writing.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated once for credit with permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 454 - Topics in Caribbean Francophone Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: the construction of identity through and beyond Négritude, Antillanité, Créolité, and migration.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 455 - Special Topics related to Francophone Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: gender studies, migration and identity-building, ethno-social tensions, political strife, religious conflicts throughout the francophone world.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 457 - Topics in Quebec and French-Canadian Literature and Culture

Credits: 3 (RD)
Analyzes representative literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts. Emphasizes contemporary works.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
FREN 460 - Advanced Oral and Written Expression

Credits: 3 (NR)
Intensive course designed to help students obtain fluency in oral and written French. Develops conversational skills and mastery of vocabulary through class discussions, oral and written reports, debates and presentations on current topics and events linked to the French and Francophone world.

Prerequisite(s): 15 credits of French, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 461 - Linguistic Structure of Modern French

Credits: 3 (NR)
Analyzes phonology, morphology, and syntax of modern standard French, through a close study of selected texts (newspaper articles, short stories, novel excerpts, informal correspondence.)

Prerequisite(s): 15 credits of French, or permission of instructor.

Notes: Optional lab work.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 462 - Stylistics

Credits: 3 (NR)
Describes and analyzes the variability of forms and styles and the more complex aspects of the French language. Develops writing skills through readings, discussions, and compositions.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 463 - History of the French Language

Credits: 3 (NR)
Diachronic study of the French language from the 9th to the 20th century, with a focus on morphology, syntax and lexicon changes. Close study of various texts (prose, poetry, political writing, theater and short stories.) in the light of their socio-historical contexts.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.
FREN 464 - Advanced Translation

Credits: 3 (RD)
Analyzes theories and methods of translation, with a focus on translation practice (French to English and English to French) of a varied selection of texts (periodicals, short stories, novel excerpts, newspaper articles, etc.).

Prerequisite(s): 15 credits of French at the 300 level or permission of the instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

FREN 465 - Special Topics related to the French language

Credits: 3 (RD)
Content varies: diachronic or synchronic study of the French language or one of its aspects; sociolinguistics; language teaching methodology; etc.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

FREN 467 - Special Topics related to French and Francophone Literature and Culture

Credits: 3 (RD)
Analyzes selected texts, authors, movements, and issues within comparative historical and cultural contexts as related to France and to various francophone regions of the world or with an interdisciplinary approach.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

FREN 470 - French and Francophone Cinema
Credits: 3 (RD)
Analyzes topics such as the early days of French cinema, la nouvelle vague, women film directors, Quebecois, African and Caribbean films, selected by type, period or director.

**Prerequisite(s):** 15 credits of French at the 300 level or permission of instructor.

**Notes:** May be repeated once with permission of department or film studies advisor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**FREN 475 - Grammatical Analysis**

Credits: 3 (NR)
Study of characteristic features of contemporary French. Examines spoken and written French, including syntactic analysis, distributional analysis, and generative-transformational grammar. Emphasis on problem areas for American learner.

**Prerequisite(s):** 15 credits of French at the 300 level or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**FREN 490 - Independent Study**

Credits: 1-3 (NR)
Research and analysis of selected problem in literature or linguistics in consultation with department member.

**Prerequisite(s):** French majors with 90 credits, and permission of chair.

**Notes:** Only 6 credits of independent study may be applied to fulfilling requirements in concentration.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

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**FREN 491 - Independent Study**

Credits: 1-3 (NR)
Research and analysis of selected problem in literature or linguistics in consultation with department member.

**Prerequisite(s):** French majors with 90 credits, and permission of chair.

**Notes:** Only 6 credits of independent study may be applied to fulfilling requirements in concentration.

**Hours of Lecture or Seminar per week:** 1-5  
**Hours of Lab or Studio per week:** 0
FREN 497 - Senior Honors Tutorial

Credits: 3 (NR)
Students who meet these requirements admitted to candidacy after submitting letter of application to departmental Honors Committee in second half of junior year. Also requires faculty recommendation and interview by Honors Committee. First semester involves weekly meetings with faculty member to discuss readings from comprehensive list prepared by French faculty. Second semester requires independent research and completion of honors essay under supervision of French faculty member.

Prerequisite(s): French majors with 90 credits, cumulative GPA of 3.00, and 3.00 in major field.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 498 - Senior Honors Tutorial

Credits: 3 (NR)
Students who meet these requirements admitted to candidacy after submitting letter of application to departmental Honors Committee in second half of junior year. Also requires faculty recommendation and interview by Honors Committee. First semester involves weekly meetings with faculty member to discuss readings from comprehensive list prepared by French faculty. Second semester requires independent research and completion of honors essay under supervision of French faculty member.

Prerequisite(s): French majors with 90 credits, cumulative GPA of 3.00, and 3.00 in major field.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 500 - Study Abroad in France or Francophone Region

Credits: 1-6 (RD)
2 to 4-week programs in France or the Francophone world with language, culture and literature courses, local visits and excursions. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

FREN 515 - Topics in Medieval French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (chanson, novel, poetry, short story) and authors in their historical and cultural contexts: geste, feudalism, socio-political and religious (in)stability. Advanced critical research and writing required.

Notes: Course work in French. May be repeated for a maximum of 6 credits when topic is different.
FREN 516 - Topics in Renaissance French Literature and Culture

Credits: 3 (RT)
Analyzes a selection of important literary texts (novel, short story, poetry, and theater) and authors in their historical and cultural contexts: humanism, reformation, and codification of language and birth of nation-state. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits when topic is different.

FREN 517 - Topics in Seventeenth-Century French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: enlightenment, social, political and philosophical trends and issues, pre-romanticism. Advanced critical research and writing required.

Notes: Content varies. May be repeated once for credit. Course work in French.

FREN 518 - Topics in Eighteenth-Century French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: enlightenment, social, political and philosophical trends and issues, pre-romanticism. Advanced critical research and writing required.

Notes: Content varies. Course work in French. May be repeated for a maximum of 6 credits when topic is different.

FREN 519 - Topics in Nineteenth-Century French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and
cultural contexts: pre-Romanticism; Romanticism; Realism; Symbolism; Naturalism. Advanced critical research and writing required.

Notes: Content varies. Course work in French. May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 520 - Topics in Twentieth and Twenty-First-Century French Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: surrealists, existentialists, new novelists, feminists, etc. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 550 - Special Topics

Credits: 3 (RT)
Specialized topics relating to French culture and literature.

Notes: Content varies. May be repeated once for credit. Course work in French.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 551 - Topics in Francophone Sub-Saharan Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: Négritude, (post)colonialism, new African voices within and beyond the continent. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 553 - Topics in North African Francophone Literature and Culture
Credits: 3 (RD)
Analyzes a selection of literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts with a focus on the construction of identity: Maghreb in pre and (post)colonial era, recent ideological trends in writing. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits when topic is different.

FREN 554 - Topics in Francophone Caribbean Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: the construction of identity through and beyond Négritude, Antillanité, Créolité, and migration. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits when topic is different.

FREN 555 - Special Topics related to Francophone Literature and Culture

Credits: 3 (RD)
Analyzes a selection of important literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts: gender studies, migration and identity-building, ethno-social tensions, political strife, religious conflicts throughout the francophone world. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits when topic is different.

FREN 557 - Topics in Quebec and French-Canadian Literature and Culture

Credits: 3 (RD)
Analyzes representative literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts. Emphasizes contemporary works. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits when topic is different.
FREN 561 - Linguistic Structure of Modern French

Credits: 3 (NR)
Analyzes phonology, morphology, and syntax of modern standard French, through a close study of selected texts (newspaper articles, short stories, novel excerpts, informal correspondence). Advanced critical research and writing required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 562 - Stylistics

Credits: 3 (NR)
Describes and analyzes the variability of forms and styles and the more complex aspects of the French language. Develops writing skills through readings, discussions, and compositions. Advanced critical research and writing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 563 - History of the French Language

Credits: 3 (NR)
Analyzes a selection of literary texts (novel, short story, poetry, and/or theater) and authors in their historical and cultural contexts with a focus on the construction of identity: Maghreb in pre and (post)colonial era, recent ideological trends in writing. Advanced critical research and writing required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 564 - Advanced Translation

Credits: 3 (NR)
Analyzes theories and methods of translation, with a focus on translation practice (French to English and English to French) of a varied selection of texts (periodicals, short stories, novel excerpts, newspaper articles, etc.) Advanced critical research and writing required.

Notes: Translations from French to English and English to French.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

FREN 565 - Special Topics Related to the French Language

Credits: 3 (RT)
Content varies: diachronic or synchronic study of the French language or one of its aspects; sociolinguistics; language teaching
methodology; etc. Advanced critical research and writing required.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  

FREN 567 - Special Topics related to French and Francophone Literature and Culture

Credits: 3 (RD)  
Explores issues related to the francophone world. Emphasis on comparative issues, not geographical areas.

Prerequisite(s): 15 credits of French at the 300 level or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  

FREN 570 - French and Francophone Cinema

Credits: 3 (RD)  
Topics such as early days of French cinema, a nouvel vague, women film directors, Quebecois, African and Caribbean films, selected by type, period or director. Advanced critical research and writing required. Viewing of films outside of class time.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  

FREN 575 - Grammatical Analysis

Credits: 3 (NR)  
Analyzes selected texts, authors, movements, and issues within comparative historical and cultural contexts as related to France and to various francophone regions of the world or with an interdisciplinary approach. Advanced critical research and writing required.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  

FREN 798 - Directed Reading and Thesis Research

Credits: 3 (NR)  
Reading and research for thesis under direction of a faculty member.
Notes: Open to degree students who desire to work on independent study with a faculty mentor or who have completed at least 24 credits and have been approved by the French Graduate Faculty to conduct research for a M.A. thesis. See Modern Classical Languages Graduate Student Handbook for complete explanation of the thesis option.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

FREN 799 - Thesis

Credits: 1-3 (RD)
Research on approved thesis topic under direction of thesis committee.

Prerequisite(s): FREN 798 and approval of director.

Notes: Students must register for a minimum of 3 credits in the first semester of 799 and maintain continuous enrollment in 799 while writing and submitting the thesis.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: S/NC

Geography and Geoinformation Science (GGS)

Offered by the College of Science

Graduate standing is prerequisite to all 600-level courses.

GGS 101 - Major World Regions

Credits: 3 (NR)
Patterns, problems, and prospects of the world’s principal human-geographic regions. Emphasizes areal differentiation and role of geographic differences in interpreting current world scene.

Fulfills general education requirement in global understanding.

Equivalent to GEOG 101 (2009-10 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 102 - Physical Geography

Credits: 3 (NR)
Interrelated processes affecting global distribution and character of climate, soils, vegetation, hydrology, and landforms. Includes elements of mapping.
Designated a Green Leaf Course.

Fulfills general education requirement in natural science (nonlab).
Equivalent to GEOG 102 (2009-10 catalog)

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GGS 103 - Human Geography**

Credits: 3 (NR)

Overview of major ideas and approaches to studying spatial aspects of human social and behavioral systems. Surveys distribution and movement of human populations, characteristics and distribution of cultural mosaics, patterns of economic interdependence, and study of forces of cooperation and conflict among people from global perspective.
Designated a Green Leaf Course.

Fulfills general education requirement in social and behavioral science.
Equivalent to GEOG 103 (2009-10 catalog)

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GGS 110 - Maps and Mapping**

Credits: 3 (NR)

Introduces maps and spatial analytic tools and methods, including geographic information systems. Familiarizes students with key geographic concepts and skills through integrating information technology with map-making technology. Includes introduction to computer and web-based geographic applications, databases, and graphics.

Equivalent to GEOG 110 (2009-10 catalog)

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GGS 121 - Dynamic Atmosphere and Hydrosphere**

Credits: 4 (NR)

Systematic study of weather, climate, energy, and hydrologic systems viewed from a geospatial and global perspective. Studies
the spatial distribution and relationships of the Earth’s climate and hydrologic systems to other Earth systems, as well as the
processes driving and changing them, including energy, climate, weather, and water resources.
Designated a Green Leaf Course.

Fulfills general education requirement in natural science (lab).

Equivalent to EOS 121 (2009-10 catalog)

**GGS 122 - Dynamic Geosphere and Ecosphere**

Credits: 4 (NR)

Systematic study of biogeography and soils, viewed from a geographic, or spatial, perspective. We will study the spatial
distribution and relationships of Earth’s biomes and soils systems to other Earth systems, and the processes driving them,
including energy, climate, nutrients, chemistry, and moisture.
Designated a Green Leaf Course.

Equivalent to EOS 122 (2009-10 catalog)

**GGS 300 - Quantitative Methods for Geographical Analysis**

Credits: 3 (NR)

Comprehensive introduction to quantitative methods in spatial analysis, with emphasis on solving geographical research
problems. Topics include nature of spatial data; collection of spatial data; preparation of spatial data for mapping, geographic
information systems, and statistical analysis; descriptive spatial statistics; areal sampling theory and methods; probability theory
and distributions; hypothesis testing; correlation and regression; and areal and point pattern spatial statistics.

Equivalent to GEOG 300 (2009-10 catalog)

**Prerequisite(s):** 30 credits, including GGS 102 and 103, or permission of instructor.

**GGS 301 - Political Geography**

Credits: 3 (NR)

Distribution and effects of power on landscape, particularly on national and global scales.

Equivalent to GEOG 301 (2009-10 catalog)
Prerequisite(s): 30 credits

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 302 - Global Environmental Hazards

Credits: 3 (NR)

Introduces applications of observational and modeling techniques to natural hazards and the threat they pose to the world, as well as a general introduction to global climate change and its effect on regional and local scales. Examples include topics of interest to different countries and regions of the world, such as earthquakes, sand and dust storms, slope failures, volcanoes, land slides, droughts and desertification, floods, hurricanes and typhoons, severe weather, wild fires (U.S., Indonesia, Africa, S. America), sea-level rise, and tsunamis. Covers Earth system science topics related to the above hazards and their coupling with anthropogenic hazards as well as how societies respond to natural disasters and mitigation.

Designated a Green Leaf Course.

Equivalent to EOS 305 (2009-10 catalog)

Prerequisite(s): 30 hours and undergraduate status

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 303 - Conservation of Resources and Environment

Credits: 3 (NR)

Provides analysis of world resources distribution, conservation, and preservation; and problems resulting from their natural occurrence and utilization. Uses knowledge from physical and social sciences to develop complex and sophisticated understanding of issues surrounding natural resource exploitation and management, conservation, and preservation. Designated a Green Leaf Course.

Fulfills general education requirement in synthesis.

Equivalent to GEOG 303 (2009-10 catalog)

Prerequisite(s): 30 credits, and completion or concurrent enrollment in all other required general education courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 304 - Populations Dimensions of Global Change
Spatial distribution of population, its causes and effects, and changing patterns resulting from population mobility. Emphasizes spatial characteristics of variables such as age, sex, race, education, and income. Designated a Green Leaf Course.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

Equivalent to GEOG 304 and EOS 304 (2009-10 catalog)

Prerequisite(s): 30 credits and completion of or concurrent enrollment in all general education requirements

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 305 - Economic Geography

Credits: 3 (NR)
Analyzes pattern of distribution of world economic activity, spatial economics behind this pattern, and influence of distribution on other spatial systems.

Equivalent to GEOG 305 (2009-10 catalog)

Prerequisite(s): 30 credits

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 306 - Urban Geography

Credits: 3 (NR)
Structure and internal differentiation of cities. Variety of perspectives on nature of cities, and opportunities for intensive use of space. Urban problems and alternatives in their spatial context.

Equivalent to GEOG 306 (2009-10 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 307 - Sustainable Development

Credits: 3 (NR)
Explores the concepts, applications, and tools for analysis and decision making in support of environmentally sustainable development. Case studies and problem-solving exercises will be used to stimulate learning and provide practical experience in addressing sustainable development issues.

Designated a Green Leaf Course.

Equivalent to EOS 306 (2009-10 catalog)

**Prerequisite(s):** 60 hours; GGS 122 and GGS 302, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GGS 308 - Field Mapping Techniques**

Credits: 3 (NR)
Basic techniques for collecting and recording spatial field data, including topographic maps, compass, transit, alidade, and geographic positioning systems. Includes field work.

Equivalent to GEOG 308 (2009-10 catalog)

**Prerequisite(s):** MATH 105, GGS 102 or 101, and 30 credits.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 6

**GGS 309 - Meteorology and Climate**

Credits: 3 (NR)
Elements of meteorology; analysis of world distribution of meteorological controls as bases of regional climatic variations.

Equivalent to GEOG 309, EOS 312 (2009-10 catalog)

**Prerequisite(s):** GGS 102, 121, or equivalent; permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GGS 310 - Introduction to Digital Cartography**

Credits: 4 (NR)
Origins, principles, and methods of thematic map design and production. Principles of graphic design, data compilation, analysis, and display.

Equivalent to GEOG 310 (2009-10 catalog)
GGS 311 - Introduction to Geographic Information Systems

Credits: 3 (NR)
Fundamental concepts and theories for appropriate use of geographic information systems (GIS). Discusses basic GIS functionality and applications in various fields.

Equivalent to GEOG 311 (2009-10 catalog)

GGS 312 - Physical Climatology

Credits: 3 (NR)
Quantitative description of nature and theory of the climate system, dynamics of atmosphere-ocean-land surface, internal interactions and response to external forcing, description of the climate record and simple climate models.
Designated a Green Leaf Course.

Equivalent to EOS 312 (2009-10 catalog)

Prerequisite(s): 30 hours; and GGS 121, MATH 113, PHYS 243-244, or permission of instructor

GGS 313 - GIS Applications for Earth Systems

Credits: 3 (NR)
An overview of fundamentals in GIS, with emphases on aspects related to Earth systems and global studies. Review the use of GIS in different aspects of the Earth systems at the global and regional scales.

Equivalent to EOS 303 (2009-10 catalog)

Prerequisite(s): 30 hours; and GGS 121, GGS 122 and IT 103, or permission of instructor.

GGS 314 - Severe and Extreme Weather
Behavior of weather events ranging from small scale (e.g., thunderstorms and tornadoes) to mesoscale (e.g., fronts and hurricanes). Introduces the dynamical and physical processes, atmospheric boundary layer processes, and coupling between different spatial scales that create and shape severe and localized weather events. Designated a Green Leaf Course.

Equivalent to CLIM 314; EOS 310 (2009-10 catalog)

**Prerequisite(s):** MATH 113 or equivalent; CLIM/PHYS 111/112 or EOS 121 or GGS 121

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall, Spring, Summer

### GGS 315 - Geography of the United States

Credits: 3 (NR)
Diversity of US physical and cultural landscapes.

Equivalent to GEOG 315 (2009-10 catalog)

**Prerequisite(s):** 6 credits of geography or American studies, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### GGS 316 - Geography of Latin America

Credits: 3 (NR)
Regional survey of physical resources, populations, cultural characteristics, and economic activities in Latin America.

Equivalent to GEOG 316 (2009-10 catalog)

**Prerequisite(s):** 6 credits of geography or Latin American studies, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### GGS 319 - Air Pollution

Credits: 3 (NR)

Devoted to air pollution fundamentals and aimed at undergraduates who are beginning to study air pollution problems. The use of
 Gaussian plume dispersion models is also covered in detail, because it serves as the basis for most computer models used for regularity analysis by the EPA. The course also deals with pollution and atmospheric interactions, and the nature of our climate. Designated a Green Leaf Course.

Equivalent to EOS 320 (2009-10 catalog)

Prerequisite(s): 30 hours

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 320 - Geography of Europe

Credits: 3 (NR)
Environmental, economic, social, and political factors influencing regional structure of Europe.

Equivalent to GEOG 320 (2009-10 catalog)

Prerequisite(s): 6 credits of geography or European studies, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 321 - Biogeography: Space, Time and Life

Credits: 3 (NR)
A survey of the relationship between distribution of plants and animals on the earth surface and the physical geography and environmental characteristics.

Equivalent to BIOL 374; EOS 321 (2009-10 catalog)

Prerequisite(s): GGS 122 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 322 - Issues in Global Change

Credits: 3 (RD)

Provides the basis for evaluating existing and emerging issues in the environmental sciences at the regional and global scale, using interdisciplinary scientific principles. Combines activities designed to provide an understanding of the following: first principles underlying regional/global issues in the environmental sciences, with attention to links among the disciplines of atmospheric sciences, biology, ecology, hydrology, oceanography, geology, human health, toxicology, and mathematical modeling; concepts of systems control, feedbacks, modeling, and hierarchical scales (spatial and temporal); role of retrospective
analyses in developing a scientifically sound basis for evaluation and analysis; and studies of specific issues of interest on a regional to global scale
Designated a Green Leaf Course.

Equivalent to EOS 322 (2009-10 catalog)

**Prerequisite(s):** GGS 121, GGS 122, or permission of instructor

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### GGS 325 - Geography of North Africa and the Middle East

Credits: 3 (NR)
Environmental, economic, and social factors of differentiation of regional structure and distribution of resources in North African and Middle Eastern countries.

Equivalent to GEOG 325 (2009-10 catalog)

**Prerequisite(s):** 6 credits of geography or courses related to Middle East; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### GGS 330 - Geography of the Soviet Succession States

Credits: 3 (NR)
Analyzes geographic factors involved in history, economic development, and geopolitical situation of the former Soviet Union.

Equivalent to GEOG 330 (2009-10 catalog)

**Prerequisite(s):** 6 credits of geography or Russian studies, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### GGS 333 - Issues in Regional Geography

Credits: 3 (NR)
Geographical study of particular region or relevant regional issue.

Equivalent to GEOG 333 (2009-10 catalog)

**Prerequisite(s):** 30 credits

**Hours of Lecture or Seminar per week:** 1-6
**Hours of Lab or Studio per week:** 0
GGS 353 - Observations of the Earth and its Climate

Credits: 3 (NR)

Provides a general introduction to observations of the Earth and its climate, focusing on regional and global aspects. Introduces remote sensing and other Earth-observing techniques, as well as providing a survey of some of the physical and mathematical aspects of remote sensing at a very high level. Concepts and foundations of remote sensing in addition to different approaches and techniques are discussed. Covers several key Earth system science topics such as El Niño, carbon dioxide increase, climate change including sea rise, ozone depletion, and the energy budget of the Earth. Designated a Green Leaf Course.

Equivalent to EOS 353 (2009-10 catalog)

Prerequisite(s): GGS 121, GGS 122 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 354 - Data Analysis and Global Change Detection Techniques

Credits: 3 (NR)

Introduces basic time series methods, especially those used in detecting trends and randomness in time series data. Various data related to global changes on different temporal and spatial scales will be identified, and the relevant analysis methods will be used to those data so that students can detect or confirm changing trends or lack of them in data. Other topics such as data formats, data visualization, and data mining may also be included based on the background of the student body.

Equivalent to EOS 354 (2009-10 catalog)

Prerequisite(s): IT 103 STAT 250 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 357 - Structures in Urban Governance and Planning

Credits: 3 (NR)

Reviews spatial, policy, and administration principles that guide planning activity in United States. Outlines differences between theory and practice; and provides tools, methods, and perspectives commonly incorporated into practice of urban and regional policy analysis. Provides orientation to public-sector economy in general; and urban administration, planning, and policy in particular.

Equivalent to GEOG 357 (2009-10 catalog)

Prerequisite(s): 30 credits
GGS 380 - Geography of Virginia

Credits: 3 (NR)
Natural and cultural forces of Virginia. Studies regional makeup and analysis of human and environmental characteristics.

Equivalent to GEOG 380 (2009-10 catalog)

Prerequisite(s): 30 credits

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 398 - Selected Topics in Global Change

Credits: 3 (RT)
Covers selected topics in global change not covered in fixed-content global change courses.

Equivalent to EOS 399 (2009-10 catalog)

Prerequisite(s): 30 credits or permission of instructor.

Notes: Content varies and is determined by instructor. May be repeated.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 399 - Selected Topics in Geography

Credits: 3 (RT)
Content varies; determined by instructor.

Equivalent to GEOG 399 (2009-10 catalog)

Prerequisite(s): 30 credits.

Notes: May be repeated for maximum of 12 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 406 - Suburban Geography
GGS 410 - Introduction to Hyperspectral Imaging

Credits: 3 (NR)
Provides an introduction to quantitative measurements by remote-sensing methods covering an introduction to quantitative spectroscopy, spectral and thermal signatures, atmospheric physics, and the electromagnetic spectrum. Emphasis will be on the scientific principles involved and the transition of the technology to real-world applications. The requisite materials to begin to understand hyperspectral imaging (HSI) technology and its many civil and military applications are presented. The course covers the needed mathematics used in the analysis of n-dimensional data. Topics such as hyperspectral concepts, data collection systems, data processing techniques, case studies, and U.S. national policy issues will be covered. The data processing techniques will include N-dimensional space, scatterplots, spectral angle mapping, spectral mixture analysis, spectral matching, and other techniques. Applications and case studies will include environmental, medical, agricultural, military, and others. Ground, airborne, and spaceborne hyperspectral systems will be covered.

Equivalent to EOS 410 (2009-10 catalog)

Prerequisite(s): PHYS 243-244, 245-246, MATH 113-114, GGS 353 GGS 416, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 411 - Advanced Digital Cartography

Credits: 3 (NR)
Design and production of full-color digital maps and information graphics, map cognition and use, and principles of desktop mapping.

Equivalent to GEOG 411 (2009-10 catalog)

Prerequisite(s): GGS 311

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 412 - Air Photography Interpretation
Methods and techniques of interpreting and using information contained in aerial photography, including applications to various aspects of physical and cultural landscape.

Equivalent to GEOG 412 (2009-10 catalog)

Prerequisite(s): 60 credits and GGS 102 or 103, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 415 - Seminar in Geography

Credits: 3 (NR)
Students produce, present original research papers.

Fulfills writing intensive requirement in the major.

Equivalent to GEOG 415 (2009-10 catalog)

Prerequisite(s): GGS 300 and 310

Notes: Capstone seminar for geography majors integrating previous course work into disciplinary framework.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 416 - Satellite Image Analysis

Credits: 3 (NR)
Examines methods and techniques of interpreting and using information obtained by non-photographic remote sensing systems, with particular emphasis on space-borne platforms. Includes analysis of imagery for both physical and cultural environments.

Equivalent to GEOG 416 (2009-10 catalog)

Prerequisite(s): 60 credits and GGS 412, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 420 - Physiography of North America

Credits: 1 to 3 (NR)
Physiographic features of North American continent; spatial distribution; and influence on cultural, demographic, and economic development of United States and Canada.
Equivalent to GEOG 420 (2009-10 catalog)

**Prerequisite(s):** 60 credits, GGS 102, 3 additional credits of geography or geology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

**GGS 455 - Environmental Impact Assessment**

Credits: 3 (NR)

Evaluates current methods and practices for conducting and planning environmental assessments to include techniques and requirements for assessing impacts on air, water, natural resources, transportation, water facilities, and industrial and community development.

Designated a Green Leaf Course.

Equivalent to EOS 455 (2009-10 catalog)

**Prerequisite(s):** GGS 122 GGG 302 or EVPP 377 or 6 hours of courses in ecology and environmental sciences or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**GGS 456 - Introduction to Atmospheric Radiation**

Credits: 3 (NR)

The content of this course is designed to help students learn about the fundamental aspects of atmospheric radiation. The goal is to understand their essential roles in advanced remote sensing, atmospheric sciences and global and environmental change. It will provide a foundation for and will be beneficial to students in taking advanced courses in those areas.

Equivalent to EOS 456 (2009-10 catalog)

**Prerequisite(s):** GGS 353/GGS 309 and a course in physics, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**GGS 463 - Applied Geographic Information Systems**

Credits: 3 (NR)

Selected applications in geographic information systems (GIS). Topics include automated data capturing and processing, spatial data models and structure including object-oriented approach, advanced spatial analytical techniques including raster modeling and network analysis, programming, and algorithm development in GIS. Major purpose of course is to extend fundamental
theories and concepts in GIS so students are able to conduct research with and on GIS.

Equivalent to GEOG 463 (2009-10 catalog)

**Prerequisite(s):** 2.00 or better in GGS 300 and 311.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GGS 480 - Internship in Geography**

Credits: 1 to 3 (RD)  
Approved study programs with specific employers.

Equivalent to GEOG 480

**Prerequisite(s):** Open only to authorized GGS majors with 90 credits and GPA of 2.50 or higher in GGS courses. Permission of instructor required.

**Notes:** Credit determined by department, may be repeated to a maximum of 6 credits. Contact department one semester before enrollment.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

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**GGS 490 - Practicum in Geographical Applications**

Credits: 1-3 (RD)  
Application of geographical research tools and techniques in conjunction with faculty instruction and research. Individualized sections taught by arrangement with full-time faculty.

Equivalent to GEOG 490 (2009-10 catalog)

**Prerequisite(s):** Open only to authorized geography majors with 90 credits. Permission of department and instructor required.

**Notes:** May be repeated to a total of 6 credits

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 1-9

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**GGS 495 - Senior Research in Global and Environmental Change**

Credits: 3 (NR)  
Applications of research tools and techniques on specific global change topics, in conjunction with faculty instruction and research. Individualized sections taught by arrangement with full-time faculty.

Equivalent to EOS 495 (2009-10 catalog)
Prerequisite(s): 90 credit hours authorized major with permission of department and instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GGS 499 - Independent Study in Geography**

Credits: 1 to 3 (RD)
Individual study of selected area of geography.

Equivalent to GEOG 499 (2009-10 catalog)

Prerequisite(s): Open only to geography majors with 90 credits and GPA of 2.50 or higher. Permission of department and instructor required.

Notes: Requires directed research paper. May be repeated to a maximum of 6 credits with permission of the department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**GGS 503 - Problems in Environmental Management**

Credits: 3 (NR)
Case studies of effects of human activities on atmospheric, hydrologic, geomorphic, and biotic processes.

Equivalent to GEOG 503 (2009-10 catalog)

Prerequisite(s): 6 credits of geography, including GGS 102.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GGS 505 - Transportation Geography**

Credits: 3 (NR)
Structure, principles, location, and development of world transportation. Critical role of transportation in moving people, goods, and ideas at international, national, regional, and urban levels.

Equivalent to GEOG 505 (2009-10 catalog)

Prerequisite(s): 6 credits of geography

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GGS 520 - Geography for Teachers

Credits: 3 (NR)
Emphasizes problems and techniques in teaching geography; and current developments in research, methodology, and philosophy in the discipline.

Equivalent to GEOG 520 (2009-10 catalog)

Prerequisite(s): Graduate standing, or permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 524 - Introduction to Environmental and Resource Economics

Credits: 3 (NR)
Introduces theory of external costs and benefits, public goods, natural resource management, and benefit and cost analysis for noneconomists. Lecture-discussion format with student presentations and participation. Analytical problem set, short writing assignments, and exams.

Equivalent to GEOG 524 (2009-2010 Catalog) and EVPP 524

Prerequisite(s): Basic algebra skills.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 525 - Economics of Human/Environment Interactions

Credits: 3 (NR)
Advanced topics in environmental, natural resource, and ecological economics for noneconomist. Emphasizes sustainability, intergenerational equity, and economic-ecological feedbacks. Designated a Green Leaf Course.

Equivalent to GEOG 525 (2009-2010 Catalog) and ECON 895/EVPP 525

Prerequisite(s): EVPP 524/GGS 524 or equivalent

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 531 - Land-Use Modeling Techniques and Applications
Survey of literature on spatially explicit empirical models of land-use change. Hands-on experience developing and running simple models. Techniques covered include statistical models, mathematical programming models, cellular automata, agent-based models, and integrated models.

Equivalent to EVPP 531 and GEOG 531 (2009-10 catalog)

**Prerequisite(s):** GGS 550, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GGS 533 - Issues in Regional Geography**

Credits: 1-6 (RT)  
Geographical study of particular region or relevant regional issue.

Equivalent to GEOG 533 (2009-10 catalog)

**Notes:** Content varies. May be repeated to a total of 12 credits with permission of the department.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

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**GGS 540 - Medical Geography**

Credits: 3 (NR)  
Spatial approaches to study of health and disease. Topics include disease ecology and diffusion, and geographic perspectives on improving health care delivery.

Equivalent to GEOG 540

**Prerequisite(s):** Course in statistics.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GGS 550 - Geospatial Science Fundamentals**

Credits: 3 (NR)  
Introduces geospatial sciences, emphasizing concepts and theories of cartography, remote sensing, air photo interpretation, Global Positioning Systems, spatial data structures, and geographic information systems. Lectures accompanied by hands-on exercises.

Equivalent to GEOG 550 (2009-10 catalog)

**Notes:** Only available for students without previous course work in cartography.
GGS 551 - Thematic Cartography

Credits: 3 (NR)
Analyzes nature of perceptual organization and visual systems in thematic map communication portrayal, graphic handling, and data analysis.

Equivalent to GEOG 551 (2009-10 catalog)

Prerequisite(s): GGS 310 or 550

GGS 553 - Geographic Information System

Credits: 3 (NR)
Sources of digital geospatial data; and methods of input, storage, display, and processing of spatial data for geographic analysis using GIS. Lectures, hands-on exercises familiarize students with current technology.

Equivalent to GEOG 553 (2009-10 catalog)

Prerequisite(s): GGS 550 or course in cartography

GGS 554 - History of Cartography

Credits: 3 (NR)
History of cartographic portrayal of Earth from ancient times through 19th century, emphasizing interrelation of human culture, technological development, and geographical knowledge as reflected in maps.

Equivalent to GEOG 554 (2009-10 catalog)

Prerequisite(s): Graduate standing

GGS 560 - Quantitative Methods
Survey of quantitative methods commonly used in geographic research. Emphasizes spatial analysis techniques.

Equivalent to GEOG 585 (2009-10 catalog)

**Prerequisite(s):** Previous course work in statistics, GGS 310 or 550

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GGS 562 - Photogrammetry**

Credits: 3 (NR)  
Treatment of photogrammetric problems, including least squares adjustments, image coordination refinements, colinearity equation, resection, relative orientation, and analytic aerotriangulation.

Equivalent to GEOG 562 (2009-10 catalog)

**Prerequisite(s):** GGS 412, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GGS 563 - Advanced Geographic Information Systems**

Credits: 3 (NR)  
Discusses advanced GIS concepts including spatial data structure, spatial analysis, programming data fusion, Internet components, and spatial database management. Hands-on activities demonstrate concepts and specific applications in both cultural and physical geography.

Equivalent to GEOG 563 (2009-10 catalog)

**Prerequisite(s):** GGS 553 or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GGS 575 - Reconstructing Past Environments: Seminar in Geoarchaeology**

Credits: 3 (NR)  
Research seminar examining intersection of geoarchaeology and paleoecology with cultural ecology. Addresses methods common to these research areas, and ranges of scales and reliability of evidences to reconstruct past environments, both natural and cultural. Applied examples cover selected geoarchaeological and paleoecological projects from variety of geographical regions.

Equivalent to GEOG 575
Prerequisite(s): Permission of instructor and course work in geography, biology, geology, or archaeology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 579 - Remote Sensing

Credits: 3 (NR)
Examines use of various types and combinations of electromagnetic energy to obtain spatial information. Concentrates on nonphotographic and spaceborne remote sensing platforms and sensors. Examines essential operational parameters for existing and future systems and strategies for visual extraction of features.

Equivalent to EOS 753 and GEOG 579 (2009-10 catalog)

Prerequisite(s): GGS 416 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 581 - World Food and Population

Credits: 3 (NR)
Topics include maldistribution of population, regional disparities in growth rates and income distribution, food production, and world hunger. Discusses population policies, with emphasis on Third World countries.

Equivalent to GEOG 581 (2009-10 catalog)

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 590 - Selected Topics in Geography

Credits: 1-3 (RT)
Analyzes topics of immediate interest.

Equivalent to GEOG 590 (2009-10 catalog)

Notes: Content varies. May be repeated to a maximum of 12 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-6

GGS 600 - Communication Skills for Scientists
Develops basic set of essential skills for scientific communication of written and oral materials. Oral skills focus on delivery of successful and informative presentations to both peers and the general public. Written communication skills focus on writing of scientific abstracts, manuscripts, and grant proposals. Meets objectives through combination of activities, including practical writing assignments, planned and extemporaneous oral presentations, discussion of grant preparation for extramural competition, and personal advice on developing and delivering oral presentations.

Equivalent to EOS 600 (2009-10 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 603 - Geographic Perspectives on Complex Natural Resource Management

Credits: 3 (NR)
Develops better understanding of strengths, limitations of restoring large and complex natural resource systems by examining critical aspects of one such effort.

Equivalent to GEOG 603 (2009-10 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 605 - Socioeconomic Applications of GIS

Credits: 3 (NR)
Provides those working with spatially referenced data the technical skills to use GIS to conduct spatial analyses on socioeconomic phenomena related to labor, retail, and real estate markets. Introduces and emphasizes the development of technical and methodological skills to understand the potential and the pitfalls of using GIS for spatial analyses of socioeconomic phenomena.

Equivalent to GEOG 605

Prerequisite(s): GGS 553

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 631 - Spatial Agent-Based Models of Human-Environment Interactions

Credits: 3 (NR)
Discusses key challenges in spatial modeling of human-environment interactions. Reviews agent-based modeling applications in urban and rural interactions, agriculture, forestry, and other areas. Hands-on development of simple ABM models and investigation of linkages between GIS and ABM.

Equivalent to EVPP 631 and GEOG 631 (2009-10 catalog)
Prerequisite(s): GGS 531 or CSS 600, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 644 - Fundamentals and Interpretation of Imaging Radar

Credits: 3 (NR)
Provides understanding of components, functionality, and use of radar remote sensing for acquiring spatial information. Concentrates on operational systems. Includes hands-on assignments.

Equivalent to GEOG 644 (2009-10 catalog)

Prerequisite(s): GGS 579, or other basic course in remote sensing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 650 - Introduction to GIS Algorithms and Programming

Credits: 3 (NR)
Introduction to programming methods and their application to Geographic Information Systems, including the fundamentals of object-oriented programming and GIS-specific data structures and algorithms. Employs an object-oriented language such as Visual Basic.Net, and existing freeware and commercial GIS libraries. Topics covered include variables, arrays, control structures, objects and classes, raster and vector data structures, spatial algorithms, and spatial indexing methods.

Equivalent to EOS 650 and GEOG 650 (2009-10 catalog)

Prerequisite(s): GGS 553 or equivalent introductory GIS course, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 653 - Geographic Information Analysis

Credits: 3 (NR)
Explores existing and potential capabilities of geographic information systems in conducting spatial analysis and modeling

Equivalent to GEOG 653 (2009-10 catalog)

Prerequisite(s): GGS 553 and 560

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GGS 655 - Map Design

Credits: 3 (NR)
Advanced examination of principles of map design, including discussions of map design research.

Equivalent to GEOG 655 (2009-10 catalog)

Prerequisite(s): GGS 310 or 550.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 656 - The Hydrosphere

Credits: 3 (NR)
Covers components and transfer processes in hydrosphere, which consists of aqueous envelope of Earth including oceans, lakes, rivers, snow, ice, glaciers, soil moisture, ground water, and atmospheric water vapor.

Equivalent to EVPP 652; EOS 656 and GEOG 570 (2009-10 catalog)

Prerequisite(s): Two semesters of calculus, partial differential equation recommended; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 657 - The Lithosphere

Credits: 3 (NR)
Global-scale overview of lithosphere; the solid nonliving Earth, its materials, cycles, plate tectonic and geomorphic processes; and history, including interactions with and history of hydrosphere, atmosphere and biosphere, and methods of analysis.

Equivalent to GEOL 601, EOS 657 and GEOG 671 (2009-10 catalog)

Prerequisite(s): Graduate standing

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 658 - Terrain Mapping

Credits: 3 (NR)
Covers fundamental methods of digitally representing terrain data, major technologies, and programs for generating terrain data; methods for quantifying terrain error and assessing terrain data quality; and a variety of applications.

Equivalent to GEOG 656 (2009-10 catalog)
**GGS 660 - Automated Cartography**

Credits: 3 (NR)
Survey of algorithms and techniques to generalize information on maps and in geographic information systems. Covers simplified representation of geographic objects, surfaces, and thematic information. Includes GIS programming component.

Equivalent to GEOG 556 (2009-10 catalog)

**Prerequisite(s):** GGS 650 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GGS 661 - Map Projections and Coordinate Systems**

Credits: 3 (NR)
Covers development of various map projections and coordinate systems, property analysis, distortions, and applications.

Equivalent to GEOG 661 (2009-10 catalog)

**Prerequisite(s):** GGS 310 or 550.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GGS 664 - Spatial Data Structures**

Credits: 3 (NR)
Studies spatial data structures and their application in digital cartography, geographic information systems, and image-processing systems. Examines raster and vector data structures, and attribution schemes and topological models. Includes data transformation, information loss, data quality, and the role of metadata.

Equivalent to GEOG 664 (2009-10 catalog)

**Prerequisite(s):** B or better in GGS 650

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GGS 670 - Introduction to Atmosphere and Weather**
Credits: 3 (NR)
Applies climatic concepts to natural and human-modified environments, and analyzes climatic change.

Equivalent to EOS 670 and GEOG 670 (2009-10 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 671 - Algorithms and Modeling in GIS

Credits: 3 (NR)
Examines several fundamental GIS algorithms based upon computational geometry and computer graphics. Also discusses issues in modeling features of different dimensions and surfaces in GIS. Significant programming expected.

Equivalent to EOS 771 (2009-10 catalog)

Prerequisite(s): Prior course or experience in GIS, and knowledge of computer programming language.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 674 - Environmental Impact Analysis

Credits: 3 (NR)
Scientific and administrative processes involved in environmental impact analysis and environmental impact statements.

Equivalent to GEOG 674 (2009-10 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 675 - Location Science

Credits: 3 (NR)
This course presents the theory and practice of Location Science - the study of the optimal or near optimal spatial location or allocation of facilities, routes, personnel, or other assets. A variety of algorithms and heuristics for location problems is presented. Lectures and both in-class and take-home exercises reinforce students’ mastery of the techniques and understanding of advanced theoretical issues.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

GGS 680 - Earth Image Processing
Credits: 3 (NR)
Focuses on how geoinformation technologies, including GIS, RS, and GPS, and spatial analytical techniques can be integrated to address various situations in environmental risk assessment, monitoring, and planning.

Equivalent to EOS 758 and GEOG 580 (2009-10 catalog)

Prerequisite(s): GGS 416 or GGS 579 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 681 - Environmental Applications of Integrated Geographic Information Technologies

Credits: 3 (NR)
Focuses on how geoinformation technologies, including GIS, RS, and GPS, and spatial analytical techniques can be integrated to address various situations in environmental risk assessment, monitoring, and planning.

Equivalent to EOS 680 (2009-10 catalog)

Prerequisite(s): GGS 753 and GGS 550 or GGS 560 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 684 - Selected Topics in Geospatial Intelligence

Credits: 3 (NR)
Covers topics relevant to geospatial intelligence, especially addressing emerging trends, focused intelligence applications, and relevant technological advances, not covered by existing courses. Sample topics addressed in this course include geosensor networks, landmine detection using remote sensing techniques, the use of unmanned aerial vehicles in geospatial intelligence, and the use of virtual reality techniques for geospatial information modeling and analyst training.

Equivalent to EOS 684 (2009-2010 Catalog)

Prerequisite(s): Admission to the Geospatial Intelligence Certificate program or permission from the program's academic director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 685 - Capstone Course in Geoinformatics

Credits: 3 (NR)
A course for students completing their geospatial intelligence (GI) certificate program. It is intended to provide a capstone experience by synthesizing the knowledge and experience they acquired in their previous courses to address a complex geospatial
intelligence problem. The course requires analytical, collaborative, and communication skills.

**Prerequisite(s):** 12 credits in the geospatial intelligence certificate program or permission of program coordinator.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

### GGS 689 - Seminar in Geographic Thought and Methodology

Credits: 3 (NR)  
Includes historical development of geographic thought and current philosophy of geography; rationale for various subfields; and geographic research techniques and methods of analysis.

Equivalent to GEOG 680 (2009-10 catalog)

**Prerequisite(s):** GGS 560

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### GGS 690 - Advanced Practicum in Geographical Applications

Credits: 1-6 (RD)  
Applies spatial technologies in conjunction with faculty instruction and research. Individualized sections taught by arrangement with full-time faculty.

Equivalent to GEOG 690 (2009-10 catalog)

**Prerequisite(s):** Permission of department.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 1-9

### GGS 695 - Internship in Geography

Credits: 1 to 6 (RD)  
Approved study programs with specific employers. Students and employer supervisors must demonstrate relevancy of study program to degree requirements.

Equivalent to GEOG 695 (2009-2010 Catalog)

**Prerequisite(s):** Permission of department.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring
GGS 698 - Directed Readings and Research

Credits: 1-3 (RT)
Reading and research on specific topic under direction of faculty member.

Equivalent to GEOG 698 (2009-10 catalog)

Prerequisite(s): Permission of instructor and department.

Notes: Written report required; oral exam and report may be required. May be repeated to a maximum of 12 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1-6

GGS 704 - Spatial Analysis and Modeling of Population

Credits: 3 (NR)
Intermediate-level, population geography course discussing demographic concepts and spatial dimensions of population. Features various indices, measures, and models commonly used in human geography.

Equivalent to EOS 704 (2009-10 catalog)

Prerequisite(s): Prior courses in quantitative methods and GIS recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 721 - Biogeography

Credits: 3 (NR)
Provides broad understanding of how physical geography and environment influence spatial and temporal distribution of plants and animals on Earth's surface.

Equivalent to EOS 721 (2009-2010 Catalog)

Prerequisite(s): Courses in ecology, chemistry, and geology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 722 - Regional and Global Issues in the Earth Sciences
Credits: 3 (NR)
Provides basis for evaluating existing and emerging issues in Earth sciences at regional and global scales, utilizing interdisciplinary scientific principles.

Equivalent to EOS 722 (2009-2010 Catalog)

Prerequisite(s): Courses in ecology, chemistry, and physics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 725 - Advanced Hydrosphere

Credits: 3 (NR)
Uses mathematical and modeling approaches for in-depth study of different components and transfer processes within hydrosphere. Topics include transfer processes relevant for oceans, lakes, rivers, snow, ice, glaciers, soil moisture, ground water, and atmospheric water vapor.

Equivalent to EOS 725 (2009-2010 Catalog)

Prerequisite(s): Two semesters of calculus, preferably partial differential equations; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 740 - Hyperspectral Imaging Systems

Credits: 3 (NR)
Provides requisite materials to understand hyperspectral imaging technology and its many civilian and military applications. Emphasizes scientific principles involved and technology application to real-world imaging systems. Topics include hyperspectral concepts and system tradeoffs; data collection systems; calibration techniques; data processing techniques and software; classification methods; and case studies. Data processing techniques include N-dimensional space, scatterplots, spectral angle mapping, spectral mixture analysis, spectral matching, and mixture tuned matched filtering. Discusses ground, airborne, and spaceborne hyperspectral remote sensing systems.

Equivalent to EOS 740 (2009-2010 Catalog)

Prerequisite(s): CSI 660 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 750 - Advanced Geographical Research Applications
Advanced research employing geographical tools and research techniques.

Equivalent to GEOG 750 (2009-10 catalog)

Prerequisite(s): Permission of instructor.

Notes: Content varies. May be repeated to a maximum of 12 credits with permission of the department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-15

GGS 754 - Earth Science Data and Advanced Data Analysis

Credits: 3 (NR)
Covers accessing and applying Earth observations and remote-sensing data for Earth system science research and applications. Major topics are data formats, analysis and visualization tools, advanced data analysis methods, and data applications. Also covers combining innovative information technology techniques and Earth science data to set up online data centers for accessing data through the web.

Equivalent to EOS 754 (2009-2010 Catalog)

Prerequisite(s): GGS 753 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 756 - Physical Principles of Remote Sensing

Credits: 3 (NR)
Emphasizes fundamental physical and mathematical principles of remote sensing. Also provides overview of the current Earth Observation System as well as the National Polar-Orbiting Operational Environmental Satellite Systems (NPOESS), and NPOESS Preparatory Project missions.

Equivalent to EOS 756 (2009-2010 Catalog)

Prerequisite(s): GGS 753 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 759 - Topics in Earth Systems Science

Credits: 1-6 (NR)
Covers selected topics in Earth systems and global changes not covered in fixed-content Earth systems and global changes
courses.
Equivalent to EOS 759 (2009-10 catalog)

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**GGS 760 - Advanced Topics in Remote Sensing**
Credits: 3 (RT)  
Content varies in the area of remote sensing.
Equivalent to EOS 760 (2009-2010 Catalog)

**Prerequisite(s):** GGS 579 or GGS 680

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**GGS 772 - Distributed Geographic Information Systems**
Credits: 3 (NR)  
Examines different aspects of science and technology in the context of distributed GIS. Includes general concepts, architecture, component design and development, and system integration as well as other advanced topics, including interoperability and agent-based GIS.

Equivalent to EOS 772 (2009-10 catalog)

**Prerequisite(s):** Introductory course in GIS and some programming experience, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**GGS 773 - Interoperability of Geographic Information Systems**
Credits: 3 (NR)  
Advanced course addressing theories, standards, and implementations of web-based interoperable geographic information systems for online data and information services. Reviews international standards, including OGC, and associated tools for interoperability.

Equivalent to EOS 773 (2009-10 catalog)

**Prerequisite(s):** GGS 553 and 754, or a course in GIS.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
GGS 780 - Graduate Internship in Earth System Science

Credits: 1-6 (RD)
Applications of knowledge and skills in Earth systems and geoinformation sciences to real-world issues and problems in private industry, government agencies, or nonprofit organizations.

Equivalent to EOS 780 (2009-10 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 785 - Geographic Field Work

Credits: 3 (NR)
Introduces nature, scope, and objectives of geographic field methods and techniques, including use of base maps, acquisition of data, and field research design. Taught as much as possible in field situations with students required to develop and carry out relevant field research projects pertaining to both physical and cultural geography.

Equivalent to GEOG 785 (2009-10 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 787 - Scientific Data Mining for Geoinformatics

Credits: 3 (NR)
Covers specialized data mining algorithms, geoscience data models, and data information systems. Emphasis on domain-specific data mining algorithms suitable for spatial data and spatio-temporal data with geoscience and geoinformatics applications. Introduces real geoscience data mining applications in detailed applications.

Equivalent to EOS 787 (2009-2010 Catalog)

Prerequisite(s): Competency in programming at the level of CSI 601-607 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 791 - Advanced Spatial Statistics

Credits: 3 (NR)
Advanced course focusing on analyzing georeferenced or spatial data represented as points or polygons. Addresses higher moments, point pattern analyses, and interpolations of points to surfaces. Includes spatial regression.
Equivalent to EOS 791 (2009-10 catalog)

**Prerequisite(s):** GGS 560 or STAT 535/554, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**GGS 792 - Seminar in Earth Systems Science**

Credits: 2 (NR)
Capstone experience. Seminars presented by faculty and students.

Equivalent to EVPP 792 and EOS 792 (2009-10 catalog)

**Prerequisite(s):** 15 Graduate Credits including CSI 655, GGS 656, and GGS 657, or permission of instructor.

**Hours of Lecture or Seminar per week:** 2
**Hours of Lab or Studio per week:** 0

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**GGS 795 - Seminar in Regional Analysis**

Credits: 3 (NR)
Analyzes and synthesizes physical and cultural elements of geography in selected region. Should be taken near end of master’s degree program. Provides opportunity to apply selective knowledge gained in previous systematic courses to specific region.

Equivalent to GEOG 795 (2009-10 catalog)

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**GGS 796 - Directed Readings and Research in Earth Systems Science**

Credits: 1-6 (RD)
Reading and research on specific topic in Earth systems and geoinformation sciences under direction of faculty member.

Equivalent to EOS 796 (2009-10 catalog)

**Prerequisite(s):** Graduate standing, permission of instructor.

**Notes:** May be repeated as necessary.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**GGS 798 - Research Project in Earth Systems Science**
Credits: 1-6 (RD)
Reading project chosen and completed under guidance of graduate faculty member resulting in acceptable technical report.

Equivalent to EOS 798 (2009-10 catalog)

Prerequisite(s): Admission to Earth Systems Science MS program, 12 graduate credits, and permission of instructor.

Notes: For students enrolled in Earth Systems Science master's program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GGS 799 - Thesis

Credits: 1-6 (RD)
Degree candidacy and departmental approval of thesis proposal.

Equivalent to EOS 799 and GEOG 799 (2009-10 catalog)

Prerequisite(s): Degree candidacy and departmental approval of thesis proposal.

Notes: May be repeated to a maximum of 6 credits earned.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

GGS 840 - Hyperspectral Imaging Applications

Credits: 3 (NR)
Introduces advanced hyperspectral imaging and multisensor concepts with emphasis on real-world civilian and military applications. Topics include advanced hyperspectral concepts, multisystem tradeoffs, data collection and processing systems, imaging radar systems, laser systems, calibration techniques, data fusion, quantitative remote sensing techniques, data compression techniques, case studies, and U.S. national policy. Applications and case studies include environmental, homeland security, medical, military, disaster mitigation, agricultural, and transportation.

Equivalent to EOS 840 (2009-2010 Catalog)

Prerequisite(s): CSI 660 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 854 - Air Pollution Dispersion
Credits: 3 (NR)
Covers the basic concepts, theories, and models of pollutant dispersal in the atmosphere and the related atmospheric systems affecting dispersal of hazardous atmospheric releases.

Equivalent to EOS 854 (2009-2010 Catalog)

Prerequisite(s): CLIM 710 or 711, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 855 - Introduction to Mesoscale Atmospheric Modeling

Credits: 3 (NR)
Introduces physical and numerical modeling issues involved in mesoscale atmospheric flows. These flows involve time and space scales associated with diurnal cycle, atmospheric inertial mode, thermal and mechanical forcing due to mesoscale terrain inhomogeneities, mesoscale precipitation systems, and downscale energy transfer from synoptic scale to mesoscale due to nonlinear flow interactions.

Equivalent to EOS 855 (2009-2010 Catalog)

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GGS 900 - Colloquium Earth Systems Sciences

Credits: 1 (RD)
Presentations in specific research areas of Earth systems and geoinformation sciences by faculty and staff, Mason faculty in related programs, and professional visitors.

Equivalent to EVPP 791; EOS 900 and GEOG 791 (2009-10 catalog)

Prerequisite(s): Graduate standing

Notes: May be repeated for credit, but maximum 3 credits may be applied to Earth systems and geoinformation sciences PhD.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

GGS 998 - Dissertation Proposal

Credits: 1-12 (RD)
Covers development of research proposal that forms basis for doctoral dissertation, under guidance of dissertation director and
doctoral committee.

Equivalent to EOS 998 (2009-10 catalog)

**Prerequisite(s):** Doctoral student, permission of instructor.

**Notes:** May be repeated, but no more than 12 credits of GGS 998 may satisfy doctoral degree requirements.

- **Hours of Lecture or Seminar per week:** 0
- **Hours of Lab or Studio per week:** 0
- **Grading:** Satisfactory/No credit only

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**GGS 999 - Dissertation**

Credits: 1-12 (RD)
Doctoral dissertation research under direction of dissertation advisor.

Equivalent to EOS 999 (2009-10 catalog)

**Prerequisite(s):** Permission of instructor.

**Notes:** May be repeated, but no more than total 24 credits in GGS 998 and 999 may be applied to doctoral degree.

- **Hours of Lecture or Seminar per week:** 0
- **Hours of Lab or Studio per week:** 0
- **Grading:** Satisfactory/No credit only

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**Geology (GEOL)**

Offered by the College of Science

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**GEOL 101 - Introductory Geology I**

Credits: 4 (NR)
Covers Earth, processes that operate within Earth and on surface, and human interaction with Earth. Topics include minerals, earthquakes and seismology, isostasy, igneous processes and rocks, paleomagnetism and plate tectonics, weathering, mass movements, rivers and streams, groundwater, glaciers, and marine processes.

Fulfills general education requirement in natural science (lab).

**Notes:** May include field trips.

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 3
GEOL 102 - Introductory Geology II

Credits: 4 (NR)
Earth processes in historical context. Topics include sedimentary rocks and principles, deformation and metamorphism, mountain building and plate tectonics, geologic time, fossils, and historical development of continents.

Fulfills general education requirement in natural science (lab).

Prerequisite(s): GEOL 101

Notes: May include field trips.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

GEOL 134 - Evolution and Extinction

Credits: 3 (NR)
Evolution and Extinction is a science class for non-science majors that explores how diversity of animals and plants has changed through geologic time, when mass extinctions occurred, when major diversifications of life occurred, and how the position of continents on the surface of the earth influenced the evolution, extinction, and distribution of life, landforms and the atmosphere.

Fulfills general education requirement in natural science (nonlab).

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

GEOL 206 - Topics in Geology I

Credits: 1-3 (RT)
Discusses particular topic in geology.

Notes: May include field trips.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

GEOL 302 - Mineralogy

Credits: 4 (NR)
Crystallographic, optical, chemical, and physical properties of minerals.

Prerequisite(s): GEOL 101 and 102 with grade of C or better, and CHEM 211.

Notes: May include field trips.
GEOL 303 - Field Mapping Techniques

Credits: 3 (NR)
Basic techniques for collecting, recording, and plotting spatial field data including use of topographic maps, compasses, transit, alidade, and global positioning systems (GPS).

Prerequisite(s): 30 credits including MATH 105 or equivalent, and GGS 102 or GEOL 101.

Notes: Includes field work.

GEOL 304 - Sedimentary Geology

Credits: 4 (NR)
Introduces sedimentation, sedimentary petrology, facies analysis, and stratigraphy.

Prerequisite(s): GEOL 101 and 102, and grade of C or better in GEOL 302.

Notes: May include field trips.

GEOL 305 - Environmental Geology

Credits: 3 (NR)
Investigates geological principles directly relating to environmental hazards. Geological causes and effects of natural disasters such as earthquakes, tsunamis, volcanoes, floods and landslides; climate variability and change; prediction of, and planning for geological hazards and disasters and understanding their major societal impacts; and medical geology. Designated a Green Leaf Course.

Prerequisite(s): GEOL 101, and either GEOL 102, GEOL 309/BIOL 309, or GGS 309

Notes: May include field trips.
GEOL 306 - Soil Science

Credits: 3 (NR)
Composition, classification, physical properties, and origin of soils.

Prerequisite(s): GEOL 101, and CHEM 103 or 211.

Notes: May include field trips.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 308 - Igneous and Metamorphic Petrology

Credits: 4 (NR)
Genesis, classification, and recognition of igneous and metamorphic rocks.

Prerequisite(s): GEOL 101 and 102, grade of C or better in GEOL 302, and MATH 105 or equivalent.

Notes: May include field trips.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

GEOL 309 - Introduction to Oceanography

Credits: 3 (NR)
Introduces physical, chemical, biological, and geological aspects of oceanic environment.

Equivalent to BIOL 309

Prerequisite(s): GEOL 101 and BIOL 103 or 213.

Notes: May include field trip.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 312 - Invertebrate Paleontology

Credits: 4 (NR)
Classification, evolutionary trends, and distribution of common invertebrate fossils.

Prerequisite(s): GEOL 101, 102; or BIOL 103, 104; or BIOL 213, 303, 304.

Notes: May include field trips.
GEOL 313 - Hydrogeology

Credits: 3 (NR)
Geological and hydrologic factors controlling occurrence, distribution, movement, quality, and development of groundwater.

Prerequisite(s): GEOL 101 or GGS 102, MATH 113, and CHEM 211.

GEOL 315 - Topics in Geology II

Credits: 1-3 (RT)
Discusses particular topic in geology.

Prerequisite(s): GEOL 101 or GEOL 102 or permission of instructor.

Notes: May include field trips.

GEOL 316 - Computers in Geology

Credits: 3 (NR)
Uses of mainframe and microcomputers, with emphasis on geologic applications.

Prerequisite(s): GEOL 101, 102, and 302, and one semester of mathematics; or permission of instructor.

GEOL 317 - Geomorphology

Credits: 4 (NR)
Analyzes processes that occur at Earth's surface and resulting landforms. Labs stress recognition and evaluation of landforms using maps and aerial photographs, and methods of data collection used in study of surficial geology.

Fulfills writing intensive requirement in the major.
**Prerequisite(s):** GEOL 101 and 102, with grade of C or better; or 6 credits in GGS, including GGS 102; GGS 412 strongly recommended.

**Notes:** May include field trips.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

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**GEOL 320 - Geology of Earth Resources**

Credits: 3 (NR)  
A survey of earth resources, including metallic and non-metallic ore deposits, mineral resources, precious gems, sand and gravel, water, and air.

**Prerequisite(s):** GEOL 101, GEOL 102, GEOL 302. GEOL 305 strongly suggested.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**GEOL 321 - Geology of Energy Resources**

Credits: 3 (NR)  
A survey of energy resources, including fossil fuels, renewable, nuclear and unconventional sources. Emphasis on origin, use and implications of development.

**Prerequisite(s):** GEOL 101 or GEOL 102, and completion of all General Education Science requirements.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**GEOL 332 - Paleoclimatology**

Credits: 3 (NR)  
This course will explore the natural evolution of Earth's climate with the goal of providing a baseline for understanding present climate variability and future trends through increased knowledge of the physical, chemical, and biological processes that influence climate over the long-term.

**Prerequisite(s):** GEOL 102 or BIOL 103 or EVPP 110.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring.
GEOL 334 - Vertebrate Paleontology

Credits: 4 (NR)
Vertebrate Paleontology explores the evolution of vertebrates from the early Paleozoic to Recent. The course will cover the systematics, anatomy, paleogeography, and ecology of extinct vertebrates. Discussions will include fishes, early tetrapods & amniotes, dinosaurs, birds and mammals. Lab portion includes paleontology techniques, analysis, and study of fossil specimens and casts. A weekend field trip is included.

Equivalent to BIOL 334

Prerequisite(s): Any two courses from the following list: GEOL 101, GEOL 102, BIOL 103, BIOL 104, BIOL 213, BIOL 303 or the permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

GEOL 363 - Coastal Morphology and Processes

Credits: 4 (NR)
Studies global coastal geomorphology and processes with emphasis on U.S. Atlantic and Gulf coasts. Topics include plate tectonics, sea level changes, sediment supply, waves, tides, storm impacts, and human activities. Lecture and extended weekend field trips to mid-Atlantic coast.

Prerequisite(s): GEOL 309 or BIOL 309 or GEOL 317 with a grade C or better; or 9 credits in geography, including GGS 309.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

GEOL 364 - Marine Geology

Credits: 3 (NR)
This course will present a global overview of the geologic origin and composition of the ocean seafloor, and an introduction to the basic principles of the geologic processes occurring in the marine environment. Primary topics include geologic, tectonic and sedimentary characteristics of the deep ocean basins and continental margins; transport and deposition of marine sediments; micropaleontology and paleoceanography; geochemistry and hydrothermal systems; and marine mineral resources.

Prerequisite(s): GEOL 101, 102, 302, and CHEM 211

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 401 - Structural Geology

Credits: 4 (NR)
Igneous, sedimentary, and metamorphic rocks in folded, faulted, and metamorphosed terrains.
Prerequisite(s): Grade of C or better in GEOL 302 and 317; successful completion of one or both of GEOL 304 or 308; and MATH 110, 111, or 113. PHYS 160 or 243 highly recommended.

Notes: May include field trips.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

GEOL 402 - Geological Development of North America

Credits: 3 (NR)
Geological history of North America in terms of plate tectonics. Geological development and history of North America's major regions.

Prerequisite(s): GEOL 101, 102, 302, 304, 308, and 401.

Notes: May include field trips.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 403 - Geochemistry

Credits: 3 (NR)
Includes stable isotope, crystal, water, and organic geochemistry; geochronology; and geochemistry of rocks.

Prerequisite(s): GEOL 101 and 102 and CHEM 211.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 404 - Geological Field Techniques

Credits: 3-8 (NR)
Mapping techniques involved in collecting geological field data.

Prerequisite(s): GEOL 101, 102, 302, 304, 308, and 401.

Notes: Includes field work.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 6-12

GEOL 405 - Advanced Seminar in Earth Resources
Credits: 3 (NR)
Analyzes current issues involving renewable and non-renewable earth resources with consideration of the economic, political, social and aesthetic significance of these resources and their utilization. Taught seminar style examining case-studies, with emphasis on discussion, reading, writing and student oral presentations.

Prerequisite(s): GEOL 101 and 102 and GEOL 302, 304 and 308 OR GEOL 305, 320 and 321 and completion of General Education.

Notes: May include field trips.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 406 - Seminar in Earth and Environmental Science

Credits: 3 (NR)
Students read, discuss research literature; produce, present original papers.

Prerequisite(s): 90 credits.

Notes: Capstone seminar for Earth and environmental science majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 408 - Practicum for Geology Laboratories

Credits: 1 (NR)
Studies techniques to make geology lab effective component in geological education. Discusses developing testing materials, supplemented by experience operating geology course lab section.

Prerequisite(s): Geology major with 80 credits, and permission of department chair.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3

GEOL 409 - Practicum for Geology Laboratories

Credits: 1 (NR)
Studies techniques to make geology lab effective component in geological education. Discusses developing testing materials, supplemented by experience operating geology course lab section.

Prerequisite(s): Geology major with 80 credits, and permission of department chair.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3
GEOL 410 - Research Proposal Preparation

Credits: 1 (NR)
Prepares students for research in GEOL 411. Includes literature research, initial data collection, and preparing research proposal.

Prerequisite(s): Geology or Earth Science major with 90 credits, cumulative GPA of 2.80 or higher, and permission of the Geology undergraduate coordinator.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

GEOL 411 - Geological Research

Credits: 3 (NR)
Geological research: data collection and reduction, interpretation, preparation of written report, and oral presentation of results.

Prerequisite(s): GEOL 410.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

GEOL 412 - Physical Oceanography

Credits: 3 (NR)
Course describes the global patterns of temperature, salinity, currents and waves in the world’s oceans, and how these patterns influence marine biota, climate, and human activity. Course introduces key concepts which explain physical features of the ocean ranging from microscopic turbulence to global circulation.

Equivalent to CLIM 412

Prerequisite(s): MATH 113 or MATH 115, and PHYS 160 or PHYS 243, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 417 - Geophysics

Credits: 3 (NR)
Basic principles of geophysics including gravity, magnetism, and seismic reflection and refraction.

Prerequisite(s): GEOL 101, MATH 113, and one year of physics; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GEOL 420 - Earth Science and Policy

Credits: 3 (NR)
Discusses Earth science issues that have policy implications. Course uses a broad definition of Earth science, from atmosphere to geosphere. Course taught seminar-style, with emphasis on discussion, reading, writing, critical analysis, and student oral presentations.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion of or concurrent enrollment in all other required general education courses; completion of at least 18 credit hours in major or minor (geology, Earth science, ocean and estuarine science, or global and environmental change), and one of the following social science-based courses: EVPP 361; ECON 103; ANTH 114; GGS 103; GLOA 101; GOVT 132 or 133; HIST 125 or 130; SOCI 101, 102, or 120.

Notes: Course may include field trips.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 458 - Chemical Oceanography

Credits: 3 (NR)
The world’s oceans, including a variety of closed basins and estuaries, comprise a complex and dynamic system of chemical processes that interact with biological, geological, physical, and atmospheric processes to play a significant role in defining the earth’s fragile environment. This course will present an overview of the origin, occurrence, and distribution of the chemical components in sea water and an introduction to the basic principals of the chemical processes taking place in the marine environment.

Equivalent to CHEM 458

Prerequisite(s): CHEM 211 and CHEM 212, and CHEM 321 or GEOL 302.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GEOL 480 - Internship

Credits: 1-3 (NR)
Approved study programs with specific employers.

Prerequisite(s): Open only to majors with 90 credits.

Notes: Contact department one semester before enrollment.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0
GEOL 500 - Selected Topics in Modern Geology

Credits: 1-3 (RD)
Topic designated in class schedule.

Prerequisite(s): Baccalaureate degree in geology, or permission of instructor.

Notes: Lecture, lab, field trip.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

GEOL 501 - Selected Topics in Modern Geology

Credits: 1-3 (RD)
Topic designated in class schedule. Lecture, lab, field trip.

Prerequisite(s): Baccalaureate degree in geology, or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

GEOL 503 - Special Topics in Earth Science

Credits: 1-6 (RD)
In-service course to strengthen and update knowledge of Earth science.

Prerequisite(s): Employment or anticipated employment as an Earth Science teacher.

Notes: May include field trips.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

GEOL 534 - Vertebrate Paleontology

Credits: 4 (NR)
Explores the evolution of vertebrates from the early Paleozoic to Recent. Covers systematics, anatomy, paleogeography, and ecology of extinct vertebrates. Discussions include fishes, early tetrapods and amniotes, dinosaurs, birds, and mammals. Lab portion includes paleontology techniques, analysis, and study of fossil specimens and casts.

Prerequisite(s): Undergraduate degree in biology or geology or permission of instructor.

Notes: A weekend field trip is included. Students who have taken GEOL 334 as an undergraduate may not take 534 as a graduate
GEOL 601 - The Lithosphere

Credits: 3 (NR)
Global-scale overview of lithosphere, solid non-living Earth, materials, cycles, plate tectonic and geomorphic processes; and history, including interactions with and history of hydrosphere, atmosphere and biosphere, and methods of analysis.

Prerequisite(s): Graduate standing.

GEOL 613 - Environmental Geochemistry and Mineralogy

Credits: 3 (NR)
Explores hot topics and aids students in developing intellectual skills to identify key research problems. Students will also improve their writing and presentation skills.

Prerequisite(s): Graduate standing.

GEOL 800 - Studies for the Doctor of Philosophy in Education

Credits: 1-6 (NR)
Program of studies designed by discipline director and approved by doctoral committee that allows student to participate in current research of discipline director and results in paper reporting student's original contributions.

Prerequisite(s): Admission to PhD in education program to study geology.

Notes: Enrollment may be repeated.

German (GERM)

Offered by the College of Humanities and Social Sciences
Placement: See the Academic Testing section in the Admission chapter.

See also FRLN course listing.

GERM 101 - Elementary German I

Credits: 3 (NR)
Designed for students with no knowledge of German. Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Students may not receive credit for GERM 101 and GERM 105 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 102 - Elementary German II

Credits: 3 (NR)
Continuation of GERM 101.

Prerequisite(s): GERM 101, or permission of department.

Notes: Students may not receive credit for GERM 102 and GERM 105 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 110 - Elementary German

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Lab work required. Students may not receive credit for GERM 110 and GERM 101, 102, or 105.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 1

GERM 201 - Intermediate German I

Credits: 3 (NR)
Further development of skills in listening, speaking, reading, and writing.

Prerequisite(s): GERM 102 and 105, appropriate placement score, or permission of department.

Notes: GERM 201 and 202 must be taken in sequence. Students may not receive credit for GERM 201 and GERM 210.
GERM 202 - Intermediate German II

Credits: 3 (NR)
Applies skills to reading, composition, and discussion.

Prerequisite(s): GERM 201, appropriate placement score, or permission of department.

Notes: Students may not receive credit for GERM 202 and GERM 210.

GERM 210 - Intermediate German

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of German speaking regions.

Prerequisite(s): GERM 110 or appropriate placement score.

Notes: Students may not receive credit for GERM 210 and GERM 201 or 202.

GERM 250 - Gateway to Advanced German

Credits: 3 (NR)
Integration of advanced intermediate-level German reading, writing, listening, and speaking skills, and the development of critical thinking about authentic texts from around the globe.

Prerequisite(s): GERM 210, appropriate placement score, or permission of department.

Notes: Taught in German

GERM 301 - Culture and Civilization
Credits: 3 (NR)
Covers development of German civilization from 18th century to present. Includes German cultural contributions to world civilization.

Prerequisite(s): 60 credits, or permission of instructor.

Notes: Taught in English.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 310 - Conversation and Composition

Credits: 3 (NR)
Develops fluency in speaking and proficiency in writing German through discussion, reports, and compositions based on texts dealing with contemporary events and issues.

Prerequisite(s): GERM 250, appropriate placement score, or permission of instructor.

Notes: Taught in German. Not for native speakers of German.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 316 - German for the Business World

Credits: 3 (NR)
Introduces terminology and structural features of business German. Emphasizes acquiring vocabulary and developing facility in reading German business articles and correspondence.

Prerequisite(s): GERM 250, appropriate placement score, or permission of instructor.

Notes: Taught in German.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 318 - Translation of Texts

Credits: 3 (NR)
Introduces principles and techniques of translation. Translation of texts from the natural and social sciences, current events, and contemporary culture.

Prerequisite(s): GERM 250 or equivalent; appropriate placement score; or permission of instructor.

Notes: Taught in German. Translations mainly from German into English.
GERM 325 - Major Writers

Credits: 3 (RD)
Works of major German, Austrian, and Swiss writers in translation.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Taught in English. Writers studied vary. May be repeated for a maximum of 6 credits when topic is different with permission of department.

GERM 340 - Survey of German Literature

Credits: 3 (NR)
Overview of history of German literature to 1880.

Prerequisite(s): GERM 250, appropriate placement score or permission of instructor.

Notes: Taught in German.

GERM 355 - Readings in Poetry

Credits: 3 (NR)
Intensive reading of German poetry in its historical context. Studies genre characteristics and development. Types of poetry studied vary.

Prerequisite(s): GERM 250, appropriate placement score or permission of instructor.

Notes: Taught in German. May be repeated for credit when subject is different, with permission of department.

GERM 365 - Readings in Narrative Prose
GERM 375 - Readings in Drama

Credits: 3 (NR)
Intensive reading of German dramas in their historical context. Study of genre characteristics and development, including performance aspects. Genre varies; may be historical drama, radio play, or epic theater.

Prerequisite(s): GERM 250, appropriate placement score, or permission of instructor.

Notes: Taught in German. May be repeated for credit with permission of department when subject is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 415 - Advanced Grammar and Style

Credits: 3 (NR)
Studies syntax, idiomatic features, and levels of style. Extensive practice in different types of written expression.

Prerequisite(s): 15 credits of German or permission of instructor.

Notes: Taught in German.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 418 - Advanced Composition

Credits: 3 (NR)
Develops proficiency in writing German through intensive practice in preparing guided and original compositions.

Prerequisite(s): 15 credits of German, or permission of instructor.

Notes: Taught in German.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GERM 442 - The Age of Goethe

Credits: 3 (NR)
Major works of Enlightenment, Sturm und Drang, Classicism, and early Romanticism. Emphasizes drama and poetry by Goethe and Schiller, with additional works by Lessing, Kleist, and other important writers of the era.

Prerequisite(s): 15 credits of German, or permission of instructor.

Notes: Taught in German.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 444 - The Literature of Romanticism

Credits: 3 (NR)
German Romantic poetry and prose. Background and some theory included.

Prerequisite(s): 15 credits of German, or permission of instructor.

Notes: Taught in German.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 450 - Modern Literature: 1880-1925

Credits: 3 (NR)
Literature of Naturalism, Impressionism, and Expressionism in Germany, Austria, and Switzerland.

Prerequisite(s): 15 credits of German, or permission of instructor.

Notes: Taught in German.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GERM 451 - Modern Literature: 1925 to the Present

Credits: 3 (NR)
Literary trends since 1925 in Germany, Austria, and Switzerland.

Prerequisite(s): 15 credits of German, or permission of instructor.
GERM 480 - Special Topics

Credits: 3 (NR)
Special topics on language, literature, or culture by theme, approach, or era.

Prerequisite(s): 15 credits of German, or permission of instructor.

Notes: Taught in German. May be repeated for credit with permission of department.

Global Affairs (GLOA)

Offered by the College of Humanities and Social Sciences

GLOA 101 - Introduction to Global Affairs

Credits: 3 (NR)
Surveys wide range of global topics: previous periods of globalization, international organizations and law, transnational corporations and global economy, immigration and refugees, world environmental concerns, world culture, war and peace, paradoxical presence of nationalism and fundamentalism in global world, and antiglobalization movement.

Fulfills general education requirement in global understanding.

GLOA 450 - Topics in Global Affairs

Credits: 1-3 (RD)
Selected topics in global affairs. Content varies.

Prerequisite(s): GLOA 101 or SOCI 120.

Notes: May be repeated for a maximum of 9 credits when topic is different.
GLOA 480 - Study Abroad

Credits: 1-6 (RD)
Study abroad under supervision of Mason faculty. Course topics, content, and locations vary.

Notes: May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

GLOA 490 - Independent Study in Global Affairs

Credits: 1-6 (RT)
Reading or research on specific topic related to globalization, under direction of faculty member.

Prerequisite(s): Global affairs majors with 90 credits, GLOA 101, and permission of instructor.

Notes: At least one written paper required. Course may involve combination of reading assignments, tutorials, presentations, or off-campus activities. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

GLOA 491 - Honors Seminar in Global Affairs

Credits: 3 (NR)
Emphasizes an interdisciplinary approach to the study of global affairs. Covers a variety of topics, including consideration of economic, political, and cultural forces at work in the complex interactions among global processes.

Prerequisite(s): Admission to Global Affairs honors in the major.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

GLOA 492 - Honors Research Project in Global Affairs

Credits: 3 (NR)
Honors-level research on specialized topic in Global Affairs culminating in substantial paper and oral presentation.

Prerequisite(s): Completion of GLOA 491 with minimum grade of B.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring
GLOA 495 - Global Experiential Learning

Credits: 1-18 (RT)
On-the-job training in transnational or international fields through approved internship programs.

Notes: Enrollment and credits controlled by Global Affairs Program. Contact Global Affairs Program one semester before planned enrollment. May be repeated for a maximum of 18 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

GLOA 600 - Global Competencies

Credits: 3 (NR)
Explores the nature of globalization. Students will understand the characteristics of the current global system; be familiar with key global issues and debates; have an advanced understanding of and appreciation for organizations, languages, cultures in many global contexts; and be better habituated to thinking across disciplinary lines.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GLOA 610 - Economic Globalization and Development

Credits: 3 (NR)
Focuses on the intersection of countries and firms in the arenas of international trade, investment and finance, as the lenses into understanding better today’s “global” economy: countries of differing levels of economic development and economic system structure, factors of monetary union and currency disequilibria, trade liberalization or protectionism, market entry, cross-border variables, risk and relations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GLOA 620 - Human Systems

Credits: 3 (NR)
Examines the human dimensions relative to international educational systems and their relationship to basic education and higher education policy, research policy, science and technology, culture, language, social justice, equity, conflict and peace, human resources and national development.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GLOA 690 - Independent Study

Credits: 3 (NR)
Reading or research on specific topic related to globalization, under directions of faculty member.

Prerequisite(s): Global Affairs major with 12 MA credits and permission of instruction.

Notes: At least one written paper required. Course may involve combination of reading assignments, tutorials, presentations, or off-campus activities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GLOA 710 - Seminar Abroad

Credits: 3 (RD)
Intensive program in a foreign setting focusing on a deep overview of the research specialization of the supervising faculty member. Required pre-departure component to set the intellectual, logistical and culture terms of the abroad period. Locations vary from year to year.

Notes: May be repeated for a maximum of 6 credits with permission of program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GLOA 720 - Capstone Research Seminar

Credits: 3 (RD)
Provides students with the opportunity to engage in significant original research an analysis of a topic in global affairs. Topics vary from year to year.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Global and Community Health (GCH)

Offered by the Health and Human Services

GCH 205 - International Health

Credits: 3 (NR)
Examines cross-cultural values in health and nutrition, exploring health- and nutrition-related problems that afflict populations
throughout the world and efforts to achieve optimal health for all. Introduces nutrition and health concerns from variety of cultures and considers population dynamics, vital statistics, global disease patterns, and cultural variations. Includes lectures, discussion, video presentations, oral presentations, and web research.

Fulfills general education requirement in global understanding.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GCH 300 - Introduction to Public Health**

Credits: 3 (NR)  
Addresses population-focused health care and examines concepts of community and public health, and health policies affecting U.S. populations. Emphasizes primary, secondary, and tertiary levels of prevention related to health problems/diseases.

**Notes:** Open only to non-BS-COMH majors.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GCH 310 - Health Behavior Theories**

Credits: 3 (NR)  
Introduces students to various theoretical models for understanding health and illness behavior. Case studies examine the nature of health from planning, implementing, and evaluating to prevention and treatment of health problems.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GCH 320 - Community Health and Literature**

Credits: 3 (NR)  
This on-line course explores key historical worldwide public health events and humankind's responses to them, through in-depth study of selected literary works. The course includes investigation of scientific, social, cultural, geographical, and political factors that affect health and policy development on local, community and global levels.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**GCH 332 - Health and Disease**

Credits: 3 (NR)  
Introduces epidemiology, health promotion, and disease prevention, and effect on health status of culturally diverse and
vulnerable individuals, families, small groups, and communities. Focuses on health problems and potential interventions throughout life span, and incorporates principles of teaching and learning as they apply to health professionals.

Prerequisite(s): Junior standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 350 - Health Education

Credits: 3 (NR)
Enables students to survey health and wellness issues related to their personal profile and explore options in reducing personal risk factors. Students define health in context of family, environment, culture, society, and life span. By examining, comparing, and using various methods of health-risk appraisal and assessment tools, students plan health education and promotion projects for targeted populations. Stresses motivational strategies for improving and maintaining health.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 360 - Health and Environment

Credits: 3 (NR)
Examines principles and methods, risk factors, prevention and control, and policies related to the aspects of human health determined by biological, physical, and chemical factors in the environment at the local, regional, and global levels.

Prerequisite(s): STAT 250 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 370 - Sexuality and Human Behavior

Credits: 3 (NR)
Introduction to human sexual behavior with an emphasis on the interaction between psychological, social, and biological factors. Topics include sexual differentiation and development, sexually transmitted infections and HIV, sexual orientation, patterns of sexual behavior, and the sexual health of individuals, communities, and global populations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

GCH 405 - International Health Policy and Practice
Credits: 3 (NR)
Examines the development and implementation of international health policies and programs. Develops planning and communication skills. Emphasizes infectious disease, maternal and child health, and nutrition.

Prerequisite(s): GCH 205, International Health

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 411 - Health Program Planning

Credits: 3 (NR)
Addresses process of program planning, development, and fundamental evaluation principles for health promotion programs. Focus on development of clear, concise objectives leading to design and evaluation of effective primary, secondary, and tertiary prevention strategies.

Prerequisite(s): GCH 332, 350

Corequisite(s): GCH 310 or instructor approval

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

GCH 412 - Fundamentals of Epidemiology

Credits: 3 (NR)
Explores health research methods for measuring population health, designing and implementing observational and experimental studies, reading health science publications, and applying research findings to global and community health.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 430 - Community Health Systems and Agencies

Credits: 3 (NR)
Introduces students to local, state, and national community health systems and agencies. Topics include the historical impact of community health systems and agencies, the influence of health advocacy groups; the relationship between human rights and health; and the need for collaboration between groups advocating for optimum human health.

Corequisite(s): GCH 411.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring
GCH 445 - Social Determinants of Health

Credits: 3 (NR)
Examine the social determinants of health and the application of this framework to social work and public health policy and practice interventions. Explore the many social justice factors that affect health and consider which community systems and social change approaches may decrease or eliminate health inequities.

Equivalent to SOCW 445

Prerequisite(s): 45 credits or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

GCH 450 - Culture, Sexuality and the Global AIDS Epidemic

Credits: 3 (NR)
Examines how the cultural values and mores regarding sexuality shape HIV/AIDS social policy and how these values and mores facilitate and hinder prevention and care efforts. Also examines several sexuality-related topics that interface with culture (e.g., gender, the sex industry, homosexuality) and the effectiveness of prevention and care initiatives around such issues as condom use, blood donation restrictions, immigration laws, sex education, and HIV testing.

Prerequisite(s): BIOL 301: (HIV/AIDS topic only) or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 460 - Program Evaluation

Credits: 3 (NR)
This introductory research course is designed to present basic concepts and methods of public health research. Emphasis is placed on critique and use of current community and public health research methods.

Prerequisite(s): Junior standing. STAT 250 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 462 - Health Promotion across the Lifespan

Credits: 3 (NR)
Addresses health maintenance issues in humans from birth to death, emphasizing prevention. Compares and contrasts prevention of acute and chronic illnesses. Analyzes health communication approaches for effective translation of evidence-based.

Prerequisite(s): GCH 332
GCH 350

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

GCH 480 - Health Maintenance and Health Aspects of Aging

Credits: 3 (NR)
Studies physiological and psychological factors that influence health and have implications for preventive measures in disease and health disorders. Examines nutrition, nature of health problems, and methods of assessing physical and psychological needs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 494 - Special Topics in Global and Community Health

Credits: 3 (RT)
Selected topics analyzing specialized areas in global and community health.

Notes: Content varies. Lecture, seminar, laboratory, workshops.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 496 - Violence in Today's Society

Credits: 3 (NR)
Examines magnitude of problem of violence globally and more specifically within the United States. Discussion and reflective activities engage students in the learning process.

Equivalent to NURS 496

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 498 - Global and Community Health Internship

Credits: 6 (NR)
Provides advanced students with the opportunity to apply community health knowledge while working under the supervision of a community preceptor in a local health organization. Students submit an application to the GCH internship coordinator the semester prior to enrollment for review. Students who have demonstrated academic excellence will receive priority internship placement.
Prerequisite(s): GCH 332, GCH 350, and GCH 411; permission of instructor; junior or senior status.

Notes: Open to community health majors only. Students are required to work a minimum of 224 hours during the semester they take the internship. This course provides for experiential learning in a community health organization under the direction of a faculty advisor and a preceptor in the community health organization. Students are expected to understand the roles and functions of the community health organization and complete a project approved by the faculty advisor and the preceptor.

The internship elective may be taken in lieu of two 3-credit elective courses by junior or senior GCH students. The course requires a weekly two-hour seminar and 15-20 hours per week of work in a community health organization.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 15-20
Grading: Satisfactory/No Credit
When Offered: Fall, Spring, Summer

GCH 499 - Independent Study in Global and Community Health

Credits: 1-6 (RT)
Provides individual study of a particular problem area in global and community health research, theory development, or education under the direction of faculty.

Prerequisite(s): Permission of instructor

Notes: May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

GCH 543 - Global Health

Credits: 3 (NR)
Examines the major infectious, nutritional, noncommunicable, neuropsychiatric, and other causes of morbidity, mortality, and disability in each world region. Explores sociocultural, economic, political, biological, and environmental factors that contribute to global and community health.

Notes: Lecture, discussion.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GCH 555 - Human Biology

Credits: 3 (NR)
Provides an overview of the biological aspects of disease processes, with emphasis on the pathophysiology of common diseases and public health measures for the prevention and control of disease in populations.
GCH 560 - Environmental Health

Credits: 3 (NR)

Examines principles and methods, risk factors, prevention and control, and policies related to the aspects of human health determined by biological, physical, and chemical factors in the environment at the local, regional, and global levels. Designated a Green Leaf Course.

Prerequisite(s): An undergraduate community health course.


Credits: 3 (NR)
Overview of HIV disease, including retrospective and current concepts and analyses, global and societal effect, and cutting-edge research. Examines development of therapeutic tools and skills to educate, reduce risks, control infection, and affect care and healing of client, family, and community, and issues of increasing dilemma for health care professionals.
Equivalent to NURS 571

GCH 585 - Care Management of Persons with Alzheimer's Disease and Related Disorders

Credits: 3 (NR)
Focuses on caring for people with dementing illnesses in acute, community, and long-term care settings. Discusses strategies for managing and evaluating care provided by family caregivers and allied health personnel.

GCH 590 - International Health Organizations

Credits: 3 (NR)
Directed at students in the global health concentration. Examines inner workings of international health organizations such as WHO, PAHO, Red Cross, Red Crescent, USAID, UNICEF, Doctors without Borders, and the World Bank. Primary concern is on organizations focused on health prevention and promotion, disease remediation, and epidemiology. Explores goals and mechanisms of these international health organizations and the mission, roles, procedures, funding sources, and evaluation of

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effectiveness in global community.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 594 - Special Topics in Health Care

Credits: 3 (RD)
Selected topics analyzing specialized areas in health care.

Equivalent to HAP 594/NURS 594

Notes: Content varies. Lecture, seminar, laboratory, and workshops.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 600 - Health Promotion Methods

Credits: 3 (NR)
Fundamental principles and practices of public health promotion and education, including historical origins; professional responsibilities; ethics; health behavior and learning theories; models for planning, implementing and evaluating programs; health literacy; public health advocacy; and the development, selection and implementation of effective instructional materials, methods, and interventions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer

GCH 601 - Introduction to Biostatistics

Credits: 3 (NR)
Applies selected biostatistics techniques to public health and health system management issues. Includes univariate and bivariate statistics, and regression analysis.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 602 - Global Health Issues Related to Violence

Credits: 3 (NR)
Explores worldwide view of violence and its impact on health. Examines biological, psychological, and social determinants of violence. The epidemiology of violence is examined with special attention to collective violence, youth violence, abuse and neglect of children and the elderly, intimate partners, sexual violence, self-directed violence, and transgenerational violence.
Preventive approaches attempted to help reduce the prevalence of violence will be addressed.

Prerequisite(s): Admission to a graduate program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GCH 605 - Social Epidemiology**

Credits: 3 (NR)
Students will learn the basic foundations of social epidemiology and learn how they can apply these principles to the global community and their own professions. Throughout the course, students will explore the health-enhancing and health-deteriorating effects of social factors, with special emphasis on the personal social environment. They will also examine the effect of macrosocial variables, such as socioeconomic status, cultural traditions, lifecycle stages, and circumstantial changes, such as migration and relocation on health and well-being.

Prerequisite(s): GCH 712 or instructor permission.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GCH 610 - Health Behavior Theory**

Credits: 3 (NR)
Introduces students to the fundamentals of social and behavioral sciences, emphasizing current health behavior theories and models. Students develop an understanding of the theoretical and scientific basis of health promotion/health education interventions and develop community need and asset assessment skills.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GCH 611 - Health Program Planning and Evaluation**

Credits: 3 (NR)
Addresses the process of program planning, development, and fundamental evaluation principles, emphasizing health promotion programs. The focus is on development of clear and concise objectives leading to the design of effective primary, secondary, and tertiary prevention strategies.

Corequisite(s): GCH 610.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**GCH 622 - Mental Health: A Global Perspective**
An introduction to mental health and mental disorders; a critical view of national and international classification of disorders; an introduction to public health perspectives on mental health and mental disorders; and a review of cultural factors related to public health dilemmas and services, locally, regionally and in the global community, from a bio-psycho-social perspective.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

GCH 637 - Normal Aging and Health Deviations

Credits: 3 (NR)
Examines biopsychosocial aspects of aging. Examines effects of age changes and health deviations on functional capacity of older persons and interventions and promotion of the elderly's capacity for self care.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 640 - Global Infectious Diseases

Credits: 3 (NR)
Examines principles and methods for the prevention and control of infectious and parasitic diseases of global importance, including malaria, HIV/AIDS, tuberculosis, influenza, helminthic infections, emerging infections, and others.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

GCH 645 - U.S. and Global Public Health Systems

Credits: 3 (NR)
Examines the organization, financing, and delivery of health services for individuals and populations in the United States and across the globe. Compares international health systems and policies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GCH 650 - Global Non-Communicable Diseases

Credits: 3 (NR)
Examines principles and methods for the prevention and control of NCDs of global importance, including cardiovascular diseases, cancer, COPD, diabetes, dementias, and others.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

**GCH 651 - Behavioral Research Methods**

Credits: 3 (NR)
Explores quantitative and qualitative research methods, principles and techniques necessary for implementation of health science research.

Equivalent to RHBS 651 (2011-2012 Catalog); GCH 551 (2010-2011 Catalog).

Corequisite(s): GCH 601 or graduate course in applied statistics

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**GCH 659 - Health Care of Aging Persons with Chronic Illnesses**

Credits: 3 (NR)
Focuses on biological, psychological, and sociocultural aspects of aging and chronic illness. Examines functional capacity and capacity for self care.

Prerequisite(s): GCH 637.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GCH 680 - International Research Ethics and Methods**

Credits: 3 (NR)
Prepares students to conduct global and community health research. Discusses ethical issues in international health research. Develops plans for identifying a research project, collecting and analyzing data, and reporting results of international health research.

Prerequisite(s): GCH 712 and a graduate-level statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GCH 690 - Independent Study**
Credits: 1-3 (NR)
In-depth studies of selected area of health science theory, research, or practice under direction of faculty.

Notes: May be repeated for a maximum of 3 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

GCH 691 - Project Management in Public Health

Credits: 3 (NR)
Course examines project management roles and environments, the project lifecycle and various techniques of work planning, and control and evaluation to achieve project objectives. Emphasizes leadership, communication, grant writing and ethics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 701 - Program Evaluation

Credits: 3 (NR)
Examines the methods used by public health professionals to determine whether and how a particular health-related program "works". Process and outcomes evaluation will be covered. Skills and knowledge relevant to evaluation strategies will be addressed, including the fundamentals of study design, how to frame evaluation questions, and understanding basic quantitative and qualitative analysis techniques for assessing program process and effects.

Prerequisite(s): GCH 601, GCH 611, and GCH 712 or Instructor Permission.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

GCH 712 - Introduction to Epidemiology

Credits: 3 (NR)
Explores epidemiological methods for measuring population health, designing and implementing observational and experimental studies, critically reading the public health literature, and applying research findings to global and community health.

Notes: Only one of GCH 712 or 714 can be taken for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 714 - Epidemiology for Nursing Practice
Targeted at students in the doctor of nursing practice program, this course provides an introduction to epidemiology as a body of knowledge and a method for analyzing health problems. Students use analytic methods to critically appraise existing literature, design and implement evaluation processes, collect and analyze data, and apply relevant findings to the practice environment.

Notes: Only one of GCH 714 or GCH 712 can be taken for credit.

**GCH 722 - Infectious Disease Epidemiology**

Credits: 3 (NR)
Focuses on the epidemiology of infectious and parasitic diseases. Emphasizes study design and data analysis to support the prevention and control of communicable diseases.

Prerequisite(s): GCH 712

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GCH 726 - Advanced Methods in Epidemiology**

Credits: 3 (NR)
Develops epidemiological skills through the study and exploration of special topics in epidemiology. Focuses on epidemiological methods and analysis, critical review of the literature, and scientific writing.

Prerequisite(s): GCH 601 or a graduate-level statistics course; one of GCH 722, 732, or 752; or instructor permission.

Notes: For MS-EBST or MPH-EPID majors only, or by instructor approval.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GCH 732 - Chronic Disease Epidemiology**

Credits: 3 (NR)
Focuses on the epidemiology of chronic diseases, including cancers, cardiovascular and lung diseases, and mental health disorders. Emphasizes study design, critical reading, and public health approaches to disease control, such as surveillance and screening.

Prerequisite(s): GCH 712.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**GCH 752 - Nutritional Epidemiology**

Credits: 3 (NR)
Focuses on the examination of the methodologies of dietary assessment and their application to design, conduct, analysis, and interpretation of epidemiologic studies related to nutrition. Introduces the practical application of nutritional epidemiology to health programs and policy.

**Prerequisite(s):** GCH 712

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**GCH 762 - Environmental Epidemiology**

Credits: 3 (NR)
Focuses on applying epidemiological principles to the study of the environment exposures and human health, emphasizing research methods and data analysis, critical review of research, communication of research results, and applications to public health.

**Prerequisite(s):** GCH 712.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**GCH 770 - Gerontology Practicum I**

Credits: 3 (NR)
Field practicum in gerontology, emphasizing applying gerontological knowledge in designated facility and developing skills to function in service organization for aging. Includes problem identification and analysis, project development, and practical experience under supervision of qualified professional. Students collaborate with preceptor to develop useful project based on organizational and client needs. Uses case study analyses to explore problem-solving approaches in variety of situations and health care or service organizations.

**Prerequisite(s):** All core course work; corequisite for gerontology majors: health services research for MS in health science.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 3

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**GCH 771 - Gerontology Practicum II**

Credits: 3 (NR)
Gerontological theoretical concepts applied in implementation and evaluation. Uses case study analyses to explore problem-solving approaches.
Prerequisite(s): GCH 770

Notes: Continuation of field practicum in gerontology. Students receive practical experience under supervision of qualified professional. Emphasizes implementation of approved project.

Hours of Lecture or Seminar per week: 2
Hours of Lab orStudio per week: 3

GCH 780 - Practicum Seminar

Credits: 0 (NR)
Provides students with guidance and preparation for engaging in the public health practicum.

Notes: This course should be taken one semester prior to enrollment in the practicum course.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Spring, Summer

GCH 788 - Public Health Research I

Credits: 3 (NR)
Provides students with skills to develop their research proposal, conduct their research goals, and complete their master's thesis, which will be completed in Public Health Research II.

Prerequisite(s): Completion of all core courses for GCH Master's degree

Notes: Course restricted to graduate students in GCH. Repeatable to maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

GCH 789 - Public Health Research II

Credits: 3 (RD)
Provides students with skills to complete their research projects and write the master's thesis.

Prerequisite(s): All core courses for the Global Health masters program and GCH 788.

Notes: Repeatable to maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
GCH 790 - Practicum in Public Health

Credits: 3 (NR)
The practicum provides students with an in-depth supervised experience in an approved public health organization. The practicum will require students to complete a project related to an actual public health issue that is a focus within the organization.

Prerequisite(s): Students must be enrolled in the MPH program in good standing. Must have completed GCH 780 and 21 credit hours in the MPH program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

GCH 792 - Culminating Experience

Credits: 0 (NR)
Provides a structured experience for students to synthesize and integrate knowledge acquired in coursework and to apply theory and principles in a situation that approximates professional practice. Serves as a means by which faculty judge whether a student has mastered public health competencies.

Prerequisite(s): Must be enrolled in the MPH program in good standing and have completed at least 30 credit hours in the MPH program.

Notes: This course should be taken during the final semester of the program. It is highly recommended that students complete all other MPH Core Courses and at least two Concentration Courses prior to enrollment in this course.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Spring, Summer

GCH 795 - Special Topics in Global and Community Health

Credits: 1-3 (RD)
Advanced special topics course to address in-depth study of contemporary areas of global and community health insufficiently covered in other courses.

Prerequisite(s): Must be enrolled in a graduate program and have permission of the instructor.

Notes: Fulfills elective requirement for MS in global health degree and global health certificate program. Topics vary. May take up to 6 credits within their degree program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
GCH 798 - Practicum in Public Health I

Credits: 3 (NR)
Provides students with supervised experience in an identified public health organization. Students will explore the structure, functions, and activities of the public health organization and understand its relationships to improving health from a global perspective.

Prerequisite(s): Completion of the global health core curriculum.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 8

GCH 799 - Practicum in Public Health II

Credits: 3 (NR)
Provides students with an in-depth supervised experience in an identified public health organization. Provides students the opportunity to complete a project related to an actual public health issue that is a focus within the organization.

Prerequisite(s): GCH 798.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 8

GCH 804 - Advanced Quantitative Data Analysis for Health Care Research I

Credits: 3 (NR)
Examines factorial ANOVA, factorial ANCOVA, repeated measures ANOVA, ANOVA and ANCOVA via regression approach, and multiway frequency analysis. Students apply mathematical calculations and interpret SPSS outputs using health care research data.

Equivalent to NURS 804

Prerequisite(s): A graduate-level statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 805 - Advanced Quantitative Data Analysis for Health Care Research II

Credits: 3 (NR)
Examines multivariate analysis of variance (MANOVA), multivariate analysis of covariance (MANCOVA), multiple regression (ordinary least squares), and logistic regression. Students apply mathematical calculations and use linear combinations of multivariate tests in health care research data.

Equivalent to NURS 805
Prerequisite(s): GCH/NURS 804 or an equivalent multivariate statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 806 - Advanced Multivariate Statistics and Data Analysis for Health Care Research

Credits: 3 (NR)
Examines canonical correlation, discriminant analysis, factor analysis and causal analysis (path models and structural equation modeling). Students analyze and interpret data using these statistical techniques.

Equivalent to NURS 806

Prerequisite(s): GCH/NURS 805 or an equivalent multivariate statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GCH 807 - Measurement Theories and Applications in Health Care Research

Credits: 3 (NR)
Theories, principles, and techniques presented as foundation for the development and evaluation of instruments for use in health care research. Includes review of statistical techniques required for understanding measurement theory, reliability, validity, item analysis, and instrument construction. Students required to design, construct, administer, analyze, and evaluate an original instrument or evaluate an existing instrument in health care research.

Equivalent to NURS 807

Prerequisite(s): GCH/NURS 805 or permission of instructor.

Notes: Completion of GCH/NURS 805 or GCH/NURS 806 is highly recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Government and International Politics (GOVT)

Offered by the College of Humanities and Social Sciences

GOVT 101 - Democratic Theory and Practice

Credits: 3 (NR)
Comparative exploration; topics include contemporary analysis of the meanings of liberty, equality, representation, property rights, voting rights, and civil responsibilities.
Fulfills general education requirement in social and behavioral science.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GOVT 103 - Introduction to American Government**

Credits: 3 (NR)
American government examined in light of basic concepts and institutions of democracy. Includes citizenship project, a first-hand observation or participation in and analysis of some public activity.

Fulfills general education requirement in social and behavioral science.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GOVT 132 - Introduction to International Politics**

Credits: 3 (NR)
Nature of international politics, approaches to study of international politics, state and nonstate actors in international system, patterns of action and interaction between nation-states, international institutions, and major global issues.

Fulfills general education requirement in global understanding.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GOVT 133 - Introduction to Comparative Politics**

Credits: 3 (NR)
Discusses methods and subject matter of comparative political analysis. Includes political systems, politics, participation in politics, government structures, policy-making process, and evaluation of political performance.

Fulfills general education requirement in global understanding.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GOVT 300 - Research Methods and Analysis**

Credits: 4 (NR)
Emphasizes asking clear, researchable questions and using appropriate evidence to answer them. Introduces broad range of evidence including quantitative and qualitative information. Studies design and analysis of surveys, government archives, case studies, and interpretations of events in journals. Examines ethical implications of information technologies.
Fulfills general education requirement in information technology (all).

Notes: Required for all majors in government and international politics, and public administration. Strongly recommended before or during first semester of enrolling in 300-level courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

GOVT 301 - Public Law and the Judicial Process

Credits: 3 (NR)
American judicial organization and operation, role of the Supreme Court in policy formation, and selected constitutional principles.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 302 - American Political Development

Credits: 3 (NR)
Examines American political development, both in itself and compared to other nations. Addresses the extent to which the United States has or has not been exceptional in its development as a nation state.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 304 - American State and Local Government

Credits: 3 (NR)

Prerequisite(s): GOVT 103.

Notes: Students may not receive credit for GOVT 204 and 304.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 305 - Contemporary American Federalism
Legal, administrative, fiscal, and political dimensions of evolving American federalism.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 307 - Legislative Behavior

Credits: 3 (NR)
Organization, processes, functions, and roles of legislature and U.S. Congress members. Topics include state legislatures and cross-national comparisons as time and resources permit.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 308 - The American Presidency

Credits: 3 (NR)
Survey of modern presidency, including constitutional origins of office, growth and influence of White House staff, Cabinet, presidential appointees and control of executive branch, relations with Congress, and domestic and national security policy making.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 309 - Government and Politics of Metropolitan Areas

Credits: 3 (NR)
Government, politics, and problems of metropolitan centers and surrounding areas.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 311 - Public Opinion and Electoral Behavior
Studies actions of voters, candidates, and political parties in relation to the expression of relevant public opinion in a democratic system.

Prerequisite(s): GOVT 103 and 300.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 312 - Political Parties and Campaigns

Credits: 3 (NR)
Characteristics and functions of political parties, influence of parties and other political forces on electoral decisions, and emphasis on parties' inability or ability to hold government accountable to citizens.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 318 - Interest Groups, Lobbying, and the Political Process

Credits: 3 (NR)
Role, internal operations, strategies, and activities of interest groups. Evaluates ability of these groups to enable citizens to influence or control government and enhance democratic process. Considers conditions under which social movements become, or fail to become, effective interest groups.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 319 - Issues in Government and Politics

Credits: 1-3 (RT)
Studies special issues relevant to government and politics. Topics announced in advance. Examples include politics and the arts, ethnic conflict and the political system, gender politics, and changing dynamics in political institutions.

Prerequisite(s): GOVT 103.

Notes: May be repeated for a maximum of 9 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GOVT 322 - International Relations Theory

Credits: 3 (NR)
Advanced inquiry into international relations. Studies theories, concepts of international relations, and major forces and issues in international politics.

Prerequisite(s): GOVT 132 or 133.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 323 - Classical Western Political Theory

Credits: 3 (NR)
Lectures, discussions of developments in Western tradition of political thought from time of Greek city-state to late medieval Christendom. Topics include nature and purpose of politics, relationship between individual and state, political significance of religion and tradition, and concept of natural law.

Prerequisite(s): GOVT 101, or 3 credits of philosophy.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 324 - Modern Western Political Theory

Credits: 3 (NR)
Lectures, discussions of developments in Western tradition of political thought from Renaissance to mid-19th century. Topics include rise of individualism in political theory, early developments in social contact theory, theories of radical popular sovereignty, and early criticisms of liberal theory.

Equivalent to PHIL 324

Prerequisite(s): GOVT 101, or 3 credits of philosophy.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 327 - Contemporary Western Political Theory

Credits: 3 (RT)
Lectures, discussions of developments in Western tradition of political thought from mid-19th century to today. Different sections focus on various political theories that have been influential during this period, such as liberal, libertarian, conservative, communitarian, Marxist, feminist, and postmodern thought.

Equivalent to PHIL 327
Prerequisite(s): GOVT 101, or 3 credits of philosophy.

Notes: May be repeated for a maximum of 12 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GOVT 328 - Non-Western Political Theory**

Credits: 3 (NR)
Theory and history of political community, governance, and development as understood by various non-Western societies, including China, Japan, India, Africa, and Islamic World; relations to Western tradition; methodology of studying other cultures; postcolonial theories; and cultural politics on contemporary globalization.

Prerequisite(s): GOVT 101 or 133.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GOVT 329 - Issues in Political Theories and Values**

Credits: 1-3 (RT)
Studies special issues relevant to theoretical and value aspects of government and politics. Topics announced in advance. Examples include ethics and politics, ethics and environmental policy, changing perspectives on civil rights and liberties, religion and politics, and changing views of public space.

Prerequisite(s): GOVT 103.

Notes: May be repeated for a maximum of 9 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**GOVT 331 - Government and Politics of Latin America**

Credits: 3 (NR)
Contemporary political systems of Latin America, with emphasis on institutions, political processes, and political behavior. Presents case studies of several key Latin American politics; discusses problems of political development.

Prerequisite(s): GOVT 132, 133.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GOVT 332 - Government and Politics of the Middle East and North Africa

Credits: 3 (NR)
Societies of Middle East and North Africa and their response to impact of internal sociocultural-political determinants and external forces. Focuses on contemporary politics, ideologies, popular manifestations, institutions, and operations.

Prerequisite(s): GOVT 132, 133.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 333 - Government and Politics of Asia

Credits: 3 (NR)
Government structures and political processes of Asian countries. Examines patterns of conflict and cooperation, and issues of economic development and political reform in rapidly changing world.

Prerequisite(s): GOVT 132, 133.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 334 - Government and Politics of Europe

Credits: 3 (NR)
Contemporary democratic political systems of Europe, with emphasis on political processes, institutions, and behavior. Presents case studies of key European policies. Discusses problems of multiparty systems, coalition governments, Eurocommunism, and stability and change in postindustrial societies.

Prerequisite(s): GOVT 132, 133.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 336 - Political Development and Change

Credits: 3 (NR)
Process of political development and change in context of modernization and industrialization. Examines patterns of political development, with emphasis on developing world.

Prerequisite(s): GOVT 132, 133.
GOVT 337 - Ethnic Politics in Western Europe and North America

Credits: 3 (NR)
Studies resurgence of ethnic nationalism in industrial democracies of Western Europe and North America, and the comparative analysis of policy issues related to ethnonationalism. Case studies drawn from the industrial democracies.

Prerequisite(s): GOVT 132, 133.

GOVT 338 - Government and Politics of Russia

Credits: 3 (NR)
Examines continuity and change in Russia's Soviet era and post-Soviet era politics and international relations.

Prerequisite(s): GOVT 132, 133.

GOVT 339 - Issues in the Politics of Advanced Industrial Societies

Credits: 1-3 (RT)
Studies selected current political issues in industrial democracies of Western Europe and North America. Specific topics chosen each semester to reflect contemporary political concerns in these countries, but political process in advanced industrial countries is organizing principle throughout the course.

Prerequisite(s): GOVT 103 or 133, or permission of instructor.

Notes: May be repeated for a maximum of 9 credits when topic is different.

GOVT 340 - Central Asian Politics

Credits: 3 (NR)
Comparative examination of political change in Central Asia with attention to national identity formation, political economy, political conflict, political Islam, and democratization.
GOVT 341 - Chinese Foreign Policy

Credits: 3 (NR)
Discuss theories and practices of Chinese foreign policy decision making, which are then used to understand China's relations with United States, Japan, Russia, Europe, and its Asian neighbors, and China's policy in issues such as human rights, environmental protection, and nuclear nonproliferation.

Prerequisite(s): GOVT 132, 133.

Notes: Fulfills the college requirement in non-Western culture.

GOVT 342 - Diplomacy

Credits: 3 (NR)

Prerequisite(s): GOVT 132, 133.

GOVT 343 - International Political Economy

Credits: 3 (NR)
Introduces international political economy. Examines interplay of economics and politics, and applies these to different issues. Focuses on issues of contemporary significance, with attention to historical issues and basic political and economic concepts.

Prerequisite(s): GOVT 132, 133; or permission of instructor.

GOVT 344 - American Foreign Policy
Central issues surrounding the conduct of America's foreign relations, with special emphasis on structural and constitutional questions, national policy objectives abroad, and conduct of foreign policy in a democracy.

Prerequisite(s): GOVT 132, 133.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 345 - Political Islam

Credits: 3 (NR)
Covers politics of religion in Muslim societies; history, ideology, and practices of key individuals, movements, and institutions; case studies of political Islam in the Middle East, Asia, Africa, and the West; plurality and diversity of political expression in Muslim world; nature of democracy in Islam; and Islamic state.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 346 - American Security Policy

Credits: 3 (NR)
Approaches U.S. National security policy from perspective of organization and implementation of specific policies. Applies theoretical concerns to historic cases to illuminate problems that continue to challenge country.

Prerequisite(s): GOVT 132, 133

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 347 - International Security

Credits: 3 (NR)
Explores enduring security problems and new developments. Examines effects of international system on defense policies of states, particularly tensions of world caught between emerging interdependence and national demands. Encourages development of critical-thinking and group and oral presentation skills.

Prerequisite(s): GOVT 132.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 351 - Administration in the Political System
Administrative structures and processes in political setting of public management. Presents organization and administrative theory, critiques, and current practices; and examines impact of changes in social, political, and economic environment on concepts, models.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

GOVT 353 - Social Entrepreneurship

Credits: 3 (NR)  
Introduces students to the different steps that social entrepreneurs work through to drive social change: identifying problem to address, developing a strategy to address the social need, fundraising, growing the organization, tracking results, and maximizing impact.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

GOVT 354 - Third-Party Government and the Nonprofit Sector

Credits: 3 (NR)  
Introduces students to the concept of third-party government and the new realities of governments employing networks of public and private actors to orchestrate the production of public goods and services. Also explores the role of nonprofit organizations as the most prominent "third parties" that governments heavily depend on in social welfare provision.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

GOVT 355 - Public Personnel Administration

Credits: 3 (NR)  
Analyzes techniques and tools in human resource management including merit system, classification, compensation, evaluation, recruitment, and labor relations. Emphasizes current legal and policy issues in personnel administration, such as diversity and privatization.

Prerequisite(s): GOVT 351.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0
GOVT 356 - Public Budgeting and Finance

Credits: 3 (NR)
Covers tools and techniques in budgeting and financial management in U.S. governments, including management of public financial institutions, budgetary process and reform, and relationship of public budgeting to national economic policy.

Prerequisite(s): GOVT 351.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 357 - Urban Governance and Planning

Credits: 3 (NR)
Framework, subject matter, uses, methods, administration, and future of public planning. Emphasizes setting goals, defining objectives, and choosing between program alternatives. Discusses political and bureaucratic constraints, and problems of implementation. Planning illustrations may be drawn from various levels of government.

Prerequisite(s): GOVT 351.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 358 - Nonprofit Financial Planning

Credits: 4 (NR)
Provides understanding of social mission and entrepreneurial cross pressures underlying financial planning and accounting in nonprofit sector. Topics include revenue sources and projections, entrepreneurial techniques, and cost analysis for nonprofit and nongovernmental entities. Lectures, student case studies.

Prerequisite(s): 60 credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

GOVT 359 - Computers in Public Management

Credits: 3 (NR)
Applies computer-based techniques to management information in public sector. Focuses on the logic and implementation of computer applications, internet technology, web development, security, and mobile apps.

Prerequisite(s): GOVT 300.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GOVT 361 - Introduction to Environmental Policy

Credits: 3 (NR)

Environmental politics and policy making since the 1970s. Primarily U.S. focus, with some discussion of global issues. Examines policy strategies and outcomes, ethical and economic debates, political controversies, lawmaking and enforcement, and role of key players.
Designated a Green Leaf Course.
Equivalent to EVPP 361

Prerequisite(s): 30 credits

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 362 - Intermediate Environmental Policy

Credits: 3 (NR)
Examines environmental issues building on learning objectives from GOVT 361. Focuses on environmental and policy issues in the US and internationally, exploring the politics of nature and the interaction of environmental science and politics and resulting controversy. Risk and uncertainty loom large in most environmental issues. Covers "natural" disasters as well as direct "man-made" problems.

Prerequisite(s): EVPP 361 or GOVT 361 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

GOVT 364 - Public Policy Making

Credits: 3 (NR)
Processes, agencies, and politics involved in the proposal making, implementation, evaluation, and revision of U.S. public policy.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 365 - State and Regional Public Policy

Credits: 3 (NR)
Examines public policy decisions that affect local and state jurisdictions in context of federal system of government. Examines context, substance, and impact of such policies as housing, transportation, land use, crime prevention, service delivery, and health care.
GOVT 366 - Public Policy Analysis

Credits: 3 (NR)
Methods of public policy analysis, evaluation, and research. Studies design and development of alternative courses of government action and evaluation of results, and problems in applying systematic analysis to political issues.

Prerequisite(s): GOVT 300.

GOVT 367 - Money, Markets and Economic Policy

Credits: 3 (NR)
Applies basic economic concepts and principles to issues facing the U.S. and global economies. Topics include productivity and economic growth, taxes, health care, globalization, income distribution and financial crises, with an emphasis on market structure, social institutions and the not-always rational behavior of investors and consumers.

Fulfills general education requirement in social and behavioral science.

GOVT 398 - Study Abroad

Credits: 3 (RT)
Study abroad. Course topics, content, and locations vary.

Notes: GOVT 398 may only be applied to a major or minor with prior written approval from the department. A maximum of 6 credits may be applied to the BA in government and international politics, the BS in public administration, or any minor offered by the Department of Public and International Affairs.

GOVT 399 - Research Practicum in Public and International Affairs

Credits: 1-3 (RD)
Applies research methods in context of assisting with faculty research. Individualized sections taught by arrangement with full-time faculty. Methods adopted vary, but generally include library research, data collection, data analysis, and report construction.
Prerequisite(s): GOVT 300, and permission of instructor

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

GOVT 407 - Law and Society

Credits: 3 (NR)
Explores relationship between law and society, including concept of law; origin, development, and role of law in society; and relationship between law and social change. Assesses different approaches and methodologies.

Prerequisite(s): CRIM 100 or GOVT 301.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 409 - Virginia Government and Politics

Credits: 3 (NR)
Examines history of politics in Virginia and current political issues. Particular attention to changing dynamics of political parties, key legislative issues, and policies of recent administrations.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 412 - Politics and the Mass Media

Credits: 3 (NR)
Responsibilities and freedoms of mass media in democracy. Explores Influence of media on citizens' opinions, elections, and decisions of public officials.

Equivalent to COMM 412

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 414 - Politics of Race and Gender
GOVT 420 - American Political Thought

Credits: 3 (NR)
Examines political, economic, and social impact of public policies and implications for race, gender, and age.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 421 - Contemporary Political Ideologies

Credits: 3 (NR)
Major political values and theories in America from formation of American republic to present. Covers changes in American political values in crisis periods and contemporary American political theory including pluralism, elite theories of democracy, and empirical political theory.

Prerequisite(s): GOVT 103

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 422 - Constitutional Interpretation

Credits: 3 (NR)
Examines Supreme Court's interpretation of constitutional powers of Congress, presidency, and judiciary. Includes examination of major decisions concerning state regulation, taxation, and interstate relations.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 423 - Constitutional Law: Civil Rights and Liberties
GOVT 424 - Constitutional Law: Criminal Process and Rights

Credits: 3 (NR)
Studies constitutional law pertaining to rights of criminally accused from stages of investigations and evidence through attorney, trial, and punishment stages at federal and state levels.

Prerequisite(s): GOVT 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 427 - Feminist Political Thought

Credits: 3 (NR)
Explores feminist political thought in historical context. Topics include feminist political movements, feminist critiques of political philosophy, and feminist contributions to political theory.

Prerequisite(s): GOVT 101, WMST 200, 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 428 - Advanced Democratic Theory

Credits: 3 (NR)
Explores various theoretical approaches to nature and justification of democracy. Topics may include liberal, communitarian, pluralist, and deliberative theories and their critics; constitutionalism; role of markets; and transnational democracy.

Equivalent to PHIL 428

Prerequisite(s): GOVT 101 or one course in philosophy

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 430 - Comparative Political Leadership
Credits: 3 (NR)
Comparative political leadership, relationships between political cultures and types of leadership, patterns of leadership recruitment, and linkages between political elites and citizenry.

**Prerequisite(s):** GOVT 132, 133.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GOVT 432 - Political Change and Social Development in Sub-Saharan Africa**

Credits: 3 (NR)
Examines relationship of culture, history, ethnicity, and religion, and contemporary political and socioeconomic developments in Africa. Special attention to implications of ethnic conflict for nation-building in the post-Cold War period, and strategies for resolving conflicts.

**Prerequisite(s):** GOVT 132, 133.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GOVT 433 - Political Economy of East Asia**

Credits: 3 (NR)
Discusses different theoretical perspectives of East Asian political economy; transformation of East Asia; and issues such as money, finance, trade, investment, environment, and energy. Focuses on issues of contemporary significance, but attention also given to history.

**Prerequisite(s):** GOVT 133 and 60 credits, or permission of instructor.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**GOVT 434 - Democracy in Global Perspective**

Credits: 3 (NR)
Comparative study of structures and performance of democracies around the world since 1975. Examines growing influence of global forces such as economy, media, and culture in process of democratization. Examines select current elections.

**Prerequisite(s):** GOVT 133.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
GOVT 443 - Law and Ethics of War

Credits: 3 (NR)
Explores sources of morality in armed conflict, and implications of such ideas for international relations. Examines content and philosophy of modern law of war.

Prerequisite(s): GOVT 132.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 444 - Issues in International Studies

Credits: 1-3 (RT)
Major issues in international systems, including international political economy and security.

Prerequisite(s): GOVT 132, 133.

Notes: May be repeated for a maximum of 9 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 445 - Human Rights

Credits: 3 (NR)
Explores philosophical, legal, and political issues at heart of modern international human rights movement. Examines historical background legal architecture of modern human rights movement.

Prerequisite(s): GOVT 132.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 446 - International Law and Organization

Credits: 3 (NR)
Nature, sources, and subject of law of nations; law and individual; territorial questions; nature, sources, and functions of international organizations; international transactions and organizations; war and present; and future status of international law.

Prerequisite(s): GOVT 132, 133.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GOVT 447 - Revolution and International Politics

Credits: 3 (NR)
Historical overview of modern revolutions as well as different theories about causes and consequences of revolutions. Special attention to Marxist-Leninist, Arab nationalist, and Islamic revolutions.

Prerequisite(s): GOVT 133.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 448 - Ethics and International Politics

Credits: 3 (NR)
Ethics and international politics ask students to wrestle with dilemmas raised by a desire to behave morally in an international system in which consensus about ethical matters is absent. Distributive justice and use of force are two overarching themes. Students also develop, apply, and justify their own perspectives on ethical problem using philosophical theory, history, and social science research.

Prerequisite(s): 60 credits, and GOVT 132 or PHIL 151.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 452 - Administrative Law and Procedures

Credits: 3 (NR)
Law of public office. Studies procedures followed by and the legal limits on administrative agencies and their officers and employees.

Prerequisite(s): GOVT 351.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 460 - Surveillance and Privacy in Contemporary Society

Credits: 3 (NR)
Philosophical perspectives, historical context, technological developments, and institutional changes that surround controversies about privacy and surveillance in contemporary society. Explores public and private institutions doing surveillance, how they calculate and manage risk, and legal constraints on surveillance activities.

Prerequisite(s): CRIM 100.
GOVT 464 - Issues in Public Policy and Administration

Credits: 1-3 (RT)
Analyzes selected policy issues in administering public policies. Topics announced in advance. Examples include environmental policy, government regulation, federal mandates, state policy, and regional policy.

Prerequisite(s): GOVT 103 plus 60 credits.

Notes: May be repeated for a maximum of 9 credits when topic is different with permission of department.

GOVT 470 - Faith and Reason in the Making of the Modern Mind

Credits: 3 (NR)
Investigates the interlocking claims of religious faith and human reason in Western culture, from Biblical times to the present. First covers tightly focused reading assignments in theology and philosophy, and second covers particular case studies, from Galileo to the Intelligent Design debate.

GOVT 471 - Millennialism and Philosophies of History in Western Culture

Credits: 3 (NR)
Is there purpose in human history? Are we really going anywhere as humanity moves through time? This seminar studies major patterns by which thinkers in the West have discerned meaning in humanity's temporal existence. Extends from the Jewish roots of historical understanding, through Christian millennialism, to contemporary naturalism.

GOVT 472 - Christianity, Secularism, and Democracy

Credits: 3 (NR)
Examines the evolving relationship between religion and the American political order, from the Reformation to George W. Bush.
**GOVT 480 - Internship**

Credits: 3 (RT)
Approved internships with specific employer. Programs relate in some capacity to government, politics, public policy, or the law. Students develop individual contracts defining learning and competencies they plan to gain from the experience. For 3 credits, a minimum of 135 hours is required.

**Prerequisite(s):** GOVT 101, 103, 132, 133

**Notes:** Contact the department one semester before enrolling. A maximum of 6 credits of GOVT 480 may be applied to a degree in government and international politics or in public administration. 3 of those credits may be applied to requirements for the major (to the advanced government field requirement for the BA in government and international politics) with prior approval of the internship coordinator. A maximum of 3 additional credits may be used for general elective credit toward the 120 credits required for the bachelor's degree.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**GOVT 490 - Synthesis Seminar**

Credits: 3 (NR)
Readings, individual or group projects, and discussion of papers reflecting on connections between liberal arts and sciences and political world.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** Completion or concurrent enrollment in all other required general education courses, GOVT 300, and 18 credits in major.

**Notes:** Students may not receive credit for 490 more than once.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**GOVT 491 - Honors Seminar**

Credits: 3 (NR)
Readings, individual or group projects, and discussions of seminar papers.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** Completion or concurrent enrollment in all other required general education courses, GOVT 300, and 18 credits in major.

**Notes:** Subject varies.
GOVT 496 - Directed Readings and Research

Credits: 1-3 (RT)
Reading and research on specific topic under direction of faculty member.

Prerequisite(s): Major in government and international politics with 90 credits and permission of instructor and department.

Notes: Written report required; oral report of research may be required. May be repeated for a maximum of 6 credits.

GOVT 500 - The Scientific Method and Research Design

Credits: 3 (NR)
Grounds students in the principles of the scientific method as the framework for investigating all research questions in political science, whether qualitative or quantitative in character (or both). Focus is on sound and rigorous research design.

GOVT 510 - American Government and Politics

Credits: 3 (NR)
Examines institutions and processes of American government, including separate institutions of power in national government, theory and practice of federal system, role of interest groups and political parties, and effects of media and public opinion on electoral behavior and policy making. Seminar examining normative and empirical research.

GOVT 511 - Problem Solving and Data Analysis I

Credits: 3 (NR)
Introduces fundamental statistical and quantitative techniques for analyzing social science data rigorously and soundly. Focuses on problem definition, research design, and problem solving under conditions of uncertainty in political science.

Equivalent to PUAD 511; GOVT 711 (2011-2012 Catalog)

Prerequisite(s): GOVT 500 and passing grade on screening exam.
GOVT 520 - Political Theory

Credits: 3 (NR)
Analyzes selected major works of ancient, modern, or contemporary political theory that illuminate basic problems and questions for people engaged in political or civic life. Examines justice, liberty, equality, autonomy, rights, obligation, participation, and nature of politics.

Prerequisite(s): Admission to the MA in political science or permission of department.

GOVT 530 - Comparative Politics

Credits: 3 (NR)
Examines fundamental issues in comparative politics and provides broad coverage of the central themes under study. Designed to help students think theoretically and critically about the study of comparative politics, its scientific objectives, and its epistemological assumptions. Within this context, students will look at concepts and approaches, as well as important theories and debates that characterize the subfield. Helps prepare students for qualifying exams in comparative politics.

GOVT 540 - International Relations

Credits: 3 (NR)
Focuses on changing structure of international politics, post-Cold War security issues, effect of globalized economy and information technology revolution, enhanced role of global corporations and nongovernmental organizations, and rise of nonsecurity issues in emerging international agenda.

GOVT 541 - Introduction to Critical Analysis and Strategic Response to Terrorism

Credits: 3 (NR)
Introduces terrorism as a complex threat to human security. Focuses on tools for analyzing terrorism and the underlying sources and conditions that contribute to it. Considers similarities and differences between terrorism and other threats to human security. Explores the lessons learned in the history of responding to terrorism. Focuses not only on different tactics of response, but also includes how different types of societies (dictatorship, democracies, etc.) have responded to terrorism and what the results of
those responses have been. Includes case studies of responses to terrorism.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 550 - Seminar in Theories of Public Administration

Credits: 3 (NR)
Reviews the theoretical traditions in American public administration, from the earliest days of the founding to the present. Concludes with consideration of contemporary theoretical debates over the proper role of public administrators and controversies about conflicting demands made on the public service and the public sector.

Prerequisite(s): GOVT 510.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 603 - Seminar in the Courts and Constitutional Law

Credits: 3 (NR)
Analyzes role, influence, and effects of U.S. courts in creating constitutional legal norms and interpreting them. Special attention to First and Fourteenth Amendments and Commerce Clause. Lecture and discussion; students expected to read and analyze leading court cases.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 604 - Seminar on Congress and Legislative Behavior

Credits: 3 (NR)
Examines theories and empirical research on the U.S. Congress and legislative behavior, including elections, representation, structures, and processes. Also examines Congress' impact on the design and implementation of public policy, interactions with other branches of government, and comparisons with parliamentary systems.

Prerequisite(s): GOVT 510.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 605 - Seminar on the Presidency

Credits: 3 (NR)
Examines the American presidency from a number of substantive and methodological perspectives. Readings and discussions in the course appraise the presidency within the system and focus on the role the presidency plays in formulating and implementing
public policy.

**Prerequisite(s):** GOVT 510.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GOVT 631 - Seminar in Comparative Politics and Institutions**

Credits: 3 (RT)  
Examines theories and practices of governance and development in comparative national settings. Course explores key subsets of the comparative politics literature in depth, including institutional change, regime types and transitions, democracy and authoritarianism, states and state-society relations, revolution, social movements, political cultures, and methods. Course is explicitly conceptual and cross-regional.

**Notes:** May be repeated for a maximum of 9 credits when topic is different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GOVT 640 - Strategic Responses to Terrorism: Coordinated Decision Making**

Credits: 3 (NR)  
Revisits, expands, and examines the critical themes developed in the terrorism certificate program. Provides students with the opportunity to apply the theoretical concepts developed in practice. Integrates the ideas, theories, and practices considered in this track within the larger field of terrorism analysis and strategic responses to this threat.

**Corequisite(s):** GOVT 541

**Notes:** This is the capstone course for the terrorism certificate program and must be completed in the final semester of the certificate program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**GOVT 641 - Seminar in Global Systems**

Credits: 3 (NR)  
Applies systems approach to understanding global politics. Emphasizes properties and functions of global systems such as population, food, disease, energy, and trade, and how world's political systems interact with them. Discusses how governance at municipal, national, and international levels affected by global systems. Examines role of nongovernmental organizations in global affairs.

**Prerequisite(s):** GOVT 540.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
GOVT 706 - Federalism and Intergovernmental Relations

Credits: 3 (NR)
Examines broad trends in governance, including theory and practice of federal, state, and local governments. May include privatization, devolution, mandating, regulatory reform, and comprehensive federalism reform.

Prerequisite(s): GOVT 510.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 712 - Problem Solving and Data Analysis II

Credits: 3 (NR)
Advanced techniques and skills for solving policy-related problems or analyzing political data. Focuses on data gathering and analysis, use of statistical software, and multivariate analysis.

Prerequisite(s): GOVT 511.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 713 - The Constitution, Criminal Procedure, and Security

Credits: 3 (NR)
Explains legal doctrines that form basis of U.S. constitutional procedural rights, how these doctrines develop, and why courts rule as they do. Evaluates strengths, weaknesses of these rights.

Prerequisite(s): CRIM 720/GOVT 728, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 717 - Qualitative Methods

Credits: 3 (NR)
Focuses on scientific design of qualitative research questions and use of specific qualitative methods in scientific analysis. Covers when and how to use qualitative research methods to answer empirical questions in political science; primary data collection methods (interviews, observations, document review); the appropriateness of different research approaches; procedural and ethical concerns that may arise in use of qualitative methods.

Prerequisite(s): GOVT 511 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GOVT 719 - Issues in American Politics

Credits: 3 (RD)
Examines significant issue in American politics and political behavior. Analyzes topic of contemporary and emerging concern.

Prerequisite(s): GOVT 510.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 725 - Democratic Theory

Credits: 3 (NR)
Examines democracy in terms of versions of liberalism, theories of social capital and civic participation, and discourses about civil, political, and human rights. How is democracy conceptualized normatively and empirically? What underlying economic, social, and cultural conditions promote democracy? What role do institutions play in creating and sustaining a stable democratic society? Takes a broadly comparative perspective, focusing on variety of established and emerging democracies around the world. Elective for students specializing in American government or international politics and comparative governments.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 726 - Theories of Justice

Credits: 3 (NR)
Overview of ancient and modern theories of justice with application to contemporary issues involving justice system and other social and political institutions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 727 - Restorative Justice

Credits: 3 (NR)
Origins of restorative justice, its principles, implications for different justice organizations and processes, and application to problems such as family violence, human rights, and reconciliation following mass victimizations.

Prerequisite(s): CRIM 700, GOVT 726, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GOVT 728 - Behavior of Law

Credits: 3 (NR)
Examines development of law, and law's effect on human behavior. Reviews theories of law's meaning and aims. Examines construction of law, and investigates consequences of law and legal decisions.

Equivalent to CRIM 720

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 731 - Advanced Seminar in Comparative Politics

Credits: 3 (RT)
Assumes basic proficiency in comparative analysis. Regionally based examination of key debates in the comparative politics field. Key theoretical and methodological debates are addressed through in depth examination of regional political processes. Regions include Latin America, Asia, Middle East, European Union, Africa, and Russia.

Prerequisite(s): GOVT 530.

Notes: May be repeated for a maximum of 6 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 732 - Comparative Justice

Credits: 3 (NR)
Survey of justice systems and their environments in different lands and cultures. Identifies commonalities and differences among justice systems, evaluates them, and considers policy implications.

Prerequisite(s): CRIM 700/ GOVT 726, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 733 - Political Islam

Credits: 3 (NR)
Provides an overview and understanding of the multifaceted nature of political Islam in the contemporary world. Covers brief history of Islam, formation of modern states in the post-colonial Muslim world, nature of contemporary Islamic radicalism and militancy and the future of Islamism.
GOVT 734 - Democratization

Credits: 3 (NR)
Examines concepts and concrete cases of democratization and cases where democratization is absent or incomplete. Investigates methods for measuring democracy and authoritarianism; the role state and society play in political change; the effects religion, the military, ethnic division, and technology have on government reform; and the extent to which international actors can encourage democratization.

GOVT 735 - Comparative Public Management

Credits: 3 (NR)
Examines the comparative decision environments for public managers and policy elites in the OECD countries generally, focusing on four models: 1) Franco-Japanese model, 2) German concentration model, 3) "Anglo-Saxon" (United States) model, 4) Chinese model.

Notes: May apply to elective credit in the fields of comparative politics and public administration.

GOVT 739 - Issues in Comparative and International Politics

Credits: 3 (RT)
Explores issues of contemporary and emerging concern in comparative and international politics.

Prerequisite(s): GOVT 540.

Notes: May be repeated for a maximum of 6 credits when topic is different.

GOVT 741 - Advanced Seminar in International Politics

Credits: 3 (RT)
Examines theoretical and methodological issues central to study of international relations by focusing on specific topic: American foreign policy, diplomacy, international law and organization, international relations theory, international ethics, human rights and humanitarian intervention, the environment, and others.
Prerequisite(s): GOVT 540.

Notes: May be repeated for a maximum of 9 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 742 - International Negotiation

Credits: 3 (NR)
Examines frameworks and perspectives that have guided scholarly work on negotiation. Students will analyze complex cases of negotiations in the areas of security, trade, and the environment, and practice negotiating key security and environmental issues on the agendas of nations and international organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 743 - International Political Economy

Credits: 3 (NR)
Examines interplay of international politics and economics. Discusses theoretical perspectives and analytical tools in academic field of international political economy, and applies theories and tools to trade, investment, exchange rates, development, regionalization, and globalization. Explores how international economic and political forces increasingly shape domestic interests, and how domestic politics affect international political economy. Lecture, discussion.

Prerequisite(s): GOVT 343 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 745 - International Security

Credits: 3 (NR)
Examines interplay of international politics and international security. Discusses theoretical perspectives and analytical tools in academic field of international security, and applies theories and tools to nuclear, biological, and chemical weapons, strategy and defense, and arms control. How domestic issues affect defense policies, terrorism, changing nature of international conflict, and human security will be examined.

Prerequisite(s): GOVT 540.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 753 - Third-Party Governance
Credits: 3 (NR)
Examines design and management of government programs that rely on other levels of government and the private sector for delivery, with focus on such governmental tools as contracts, grants, loans, regulation, and tax credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 755 - Seminar in Politics and Bureaucracy

Credits: 3 (NR)
Explores research and theory on political causes and effects of actions of government bureaucratic agencies. Readings examine origins of agencies, influences on decisions and programs, sources of internal and external accountability, pathologies of bureaucracies, and contributions bureaucracies make on effective and just governance.

Prerequisite(s): GOVT 510.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 758 - Homeland/Transportation Security Administration

Credits: 3 (NR)
Examines the terrorist attacks of 9/11, vulnerabilities of the aviation security at that time, failure of elected officials and administrators to act more decisively to improve security before 9/11, and the policy and administrative responses to the 9/11 attacks, including the creation of the Transportation Security Administration and the Department of Homeland Security. Includes the development of radical Islam and the rise of Osama bin Laden and Al Qaeda.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 759 - Issues in Public Administration and Management

Credits: 1-3 (RD)
Current issues in administration and management of public organizations in contemporary American government. Includes practical applications of theories and analysis to managerial problems. Emphasizes competence in improving management in selected government settings.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 794 - Internship
Credits: 1-6 (RT)
Work-study program with specific employers.

Prerequisite(s): Admission to graduate program and 12 credits.

Notes: Contact internship coordinator one semester before enrollment. Credit determined by department. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

GOVT 796 - Directed Readings and Research

Credits: 1-6 (RT)
Reading and research on specific topic under direction of faculty member.

Prerequisite(s): 15 credits of GOVT courses at 500 level and above, and permission of instructor.

Notes: Written paper required.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

GOVT 798 - Political Science Research Project

Credits: 3 (NR)
Research project related to student's concentration under supervision of a faculty advisor. Student produces substantial and original contribution to political science knowledge on model of article in scholarly journal.

Prerequisite(s): 24 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

GOVT 799 - Political Science Thesis

Credits: 1-6 (RT)
Substantial and original research paper with guidance of faculty advisor. Thesis proposal must be approved in advance by advisor and two faculty members who comprise thesis committee. Completed research must be approved by committee and defended publicly in oral presentation.

Prerequisite(s): 24 credits, and approval of thesis proposal.

Hours of Lecture or Seminar per week: 1-4
GOVT 800 - PhD Research Seminar

Credits: 3 (NR)
Provides an opportunity for PhD students in political science to present and refine independent research, and to further improve understanding of social scientific method as they prepare for conference presentations, qualifying exams, and subsequent dissertations.

Notes: Open to PhD students in political science only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring.

GOVT 810 - American Political Development

Credits: 3 (NR)
Advanced graduate-level seminar on historical roots of American politics. Examines political culture and historical development of U.S. institutions, and how laws and programs have been affected by historical and cultural development.

Prerequisite(s): GOVT 510.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 811 - Advanced Seminar in American Institutions

Credits: 3 (RT)
Advanced graduate-level seminar on specific topics of contemporary research and theory in American governmental institutions. Topics vary to include presidential politics, Congress, and politics of the judiciary. Readings include classic and contemporary literature. Seminar format with discussion, student presentations.

Prerequisite(s): GOVT 510.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 815 - Advanced Seminar in Political Behavior
GOVT 820 - Advanced Topics in Political Thought

Credits: 3 (RT)
Advanced graduate-level seminar on topics of contemporary research and theory in political thought. Topics vary to include political ideologies, feminist theory, and political theory. Seminar format with discussion, student presentations.

Prerequisite(s): GOVT 520.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 831 - Research Seminar in Regional Political Culture and Development

Credits: 3 (NR)
Advanced graduate-level seminar on theories of political culture and economic development applied to Middle East, Latin America, Asia, and Africa. Debates economic growth and development from broad and rigorous analytical base.

Prerequisite(s): GOVT 540.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 841 - Ethics and Human Rights in International Affairs

Credits: 3 (NR)
Seminar on ethical behavior in an international system in which consensus about ethical matters is absent. Overarching themes are distributive justice, human rights, and use of force. Students develop, apply, and justify their own perspective on an ethical problem using ethical theory and social science research.

Prerequisite(s): GOVT 540.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
GOVT 843 - Diplomacy

Credits: 3 (NR)
Advanced graduate seminar on theory and practice of diplomacy; alliance construction and destruction; coercive and cooperative diplomacy; diplomacy of certain great powers such as America, Russia, China, France, and Japan, and small and revolutionary powers. Also examines diplomacy and the media, and day-to-day diplomacy.

Prerequisite(s): GOVT 540.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 850 - Advanced Seminar in Public Administration Research and Theory

Credits: 3 (RD)
Focuses on a topic of central concern in contemporary public administration research and theory. Content of the seminar varies but includes such topics as organizing for homeland security, managerial and political effects of e-government, or the application of principal-agency models in public management.

Prerequisite(s): GOVT 510, 650.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 851 - Doctoral Seminar in Theories of Organization and Bureaucracy

Credits: 3 (NR)
Examines key issues in organization theory and behavior. Issues include organization design; interorganizational coordination, intelligence and decision making systems; leadership and motivation theories; and theories or organizations as agents of political and social change. Uses case studies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GOVT 852 - Seminar in Political Leadership

Credits: 3 (NR)
Graduate seminar on theories and practices of political and governmental leadership in American and comparative settings. Domestic and comparative cases of leadership in state-building, presidency, and public administration. Primary or secondary research on leaders encouraged.

Prerequisite(s): GOVT 510.
GOVT 853 - Advanced Seminar in Global Innovations in Public Finance

Credits: 3 (NR)
Explores how financial decisions by government jurisdictions are affected by global competition and global markets. The impact of cross-national movements of capital and information on tax, tariff, and interest rate policies will be examined, as will the numerous organizations, such as the World Bank, that have been created to reduce the impact on developing nations. Government and supernational efforts to deal with the unintended consequences and global capital flows will also be examined.

GOVT 998 - Doctoral Dissertation Proposal

Credits: 3-6 (RT)
Work on research proposal that forms basis for doctoral dissertation.

Prerequisite(s): Advancement to candidacy.

GOVT 999 - Doctoral Dissertation Research

Credits: 1-12 (RT)
Research on approved dissertation topic under direction of dissertation committee.

Prerequisite(s): Approval of dissertation proposal.

Notes: May be repeated for up to 9 credits in a semester, but no more than 15 total.

Graduate School of Management (GSOM)

Offered by the School of Management
GSOM 540 - Analysis of Financial Decisions

Credits: 3 (NR)
Provides a survey of financial decision-making. Assists students with developing a framework within which they can understand the linkages between financial decisions and organizational performance. Examines methods for using information based on financial statements in making decisions and assessing performance, evaluating investment opportunities, and choosing among alternative sources of funds. Focuses on public firms in the corporate sector as well as applications for privately-held companies and organizations in the government and non-for-profit sectors.

Prerequisite(s): Graduate admission or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GSOM 746 - Real Estate Analysis and Valuation

Credits: 3 (NR)
Overview of real estate assets, markets, and decisions. Emphasizes development of analytical techniques and information required for implementation. Includes legal, economic, and public policy perspectives.

Equivalent to MBA 746

Prerequisite(s): Graduate admission or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GSOM 747 - Real Estate Finance

Credits: 3 (NR)
Examines financing of residential and income-producing real estate from perspectives of both suppliers and users of funds. Focuses on financing alternatives, primary and secondary markets, and decision implications of available arrangements.

Equivalent to MBA 747

Prerequisite(s): Graduate admission or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GSOM 748 - Real Estate Investment

Credits: 3 (NR)
Develops frameworks for analyzing decisions about investing in real estate assets. Focuses on acquisition and analysis of information required to evaluate potential performance of assets. Applications of theories and techniques through case studies.
Equivalent to MBA 748

Prerequisite(s): Graduate admission or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Greek (GREE)

Offered by the College of Humanities and Social Sciences

GREE 150 - Classical Greek I

Credits: 3 (NR)
Addresses linguistic, semantic, and cultural aspects. Covers basic structure and vocabulary, its place among other world languages and its unique role in development of modern thought.

Notes: Lectures, discussions supplemented by web-posted material.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

GREE 160 - Classical Greek II

Credits: 3 (NR)
Expands proficiency, refines grasp of morphology and syntax, and fosters greater command of vocabulary. Introduces selected original passages from Greek classical authors.

Prerequisite(s): GREE 150 or permission of instructor.

Notes: Lectures, discussions supplemented by web-posted material.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Health Administration and Policy (HAP)

Offered by the Health and Human Services

HAP 201 - Health Professions Careers

Credits: 3 (NR)
Acquaints students early in their college education with a variety of health professions careers. Provides overview of the health
care system, and identifies the current supply and demand for health care professionals. Presents information about educational and licensing requirements as well as expected salaries. Defines professionalism and outlines the principal rights and responsibilities of being a health care professional.

Equivalent to HHS 201 (2010-2011 Catalog)

**HAP 202 - Medical Terminology**

Credits: 3 (NR)
Prepares students with a basic understanding of medical terminology needed to work in a wide variety of healthcare environments.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall, Summer, Spring.

**HAP 290 - Lifestyle Management through Systems Analysis**

Credits: 3 (NR)
In this introductory course on practical application of Bayesian causal modeling techniques and Statistical Process Control tools, students make resolutions and analyze their progress toward goal achievement. Each student maintains a diary and analyzes it using Bayesian causal modeling techniques to understand the constraints and causes leading to their success and failures. Students analyze their pattern of success using Statistical Process Control tools and engage cyclical assessment of their self improvements.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall

**HAP 301 - Health Care Delivery in the United States**

Credits: 3 (NR)
Introduces history and current structure and function of U.S. health care delivery. Explores components and subsystems of health care, and sociopolitical (public and private) context that shapes system and affects access to health care and delivery of health services.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HAP 307 - Assisted Living/Senior Housing Management and Philosophy**
Overview of growth of assisted living industry, its role in health care continuum, current or proposed regulatory environments, and differences between assisted living and other forms of senior health care and senior living services. Specific instruction provided in philosophy and day-to-day management of assisted-living communities, including resident care, operations, finance and budgeting, human resources and staffing, and successful marketing and community relations. Also examines industry future, including cutting-edge programs and technologies, and approaches to creating next generation of assisted-living services.

**HAP 310 - Healthcare Ethics**

Credits: 3 (NR)
Introduces current ethical ideas and issues in healthcare and the healthcare system. Case studies require students to apply critical thinking in ethical decision making situations encountered by healthcare professionals.

**Prerequisite(s):** HAP 301.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

**HAP 312 - Healthcare Law**

Credits: 3 (NR)
Introduces students to the legal environment in healthcare with emphasis on laws and regulations of routine importance to healthcare managers in the areas of labor, contracts, real estate, medical malpractice, general business, and intellectual property.

**Prerequisite(s):** HAP 301.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

**HAP 360 - Introduction to Health Information Systems**

Credits: 3 (NR)
An introduction to basic information management in health care service organizations. Provides an overview of health information systems for selected administrative functions and clinical care services, including electronic data interchange for billing and claims management, institutional approaches to ensuring data security and privacy, and information management and decision support for managers and clinicians.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
HAP 361 - Health Databases

Credits: 3 (NR)
Introduces students to the design and use of various health and healthcare databases, and provides hands-on experience with database design and use. Reviews database management systems. Examines the application of databases for both clinical and managerial purposes.

Prerequisite(s): HAP 360

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

HAP 392 - Human Resources Management in Healthcare

Credits: 3 (NR)
Exposes students to the major issues, laws, administrative processes, procedures, and psychological factors to be considered when developing a human resources management system in healthcare organizations.

Prerequisite(s): HAP 301.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

HAP 395 - Health Care Finance

Credits: 3 (NR)
Introduces finance in health care organizations. Reviews issues in reimbursement structures, regulatory mechanisms, cost control, and related factors affecting financial management of health service organizations including financial decision support skills.

Prerequisite(s): HAP 301

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 396 - Strategic Health Management and Planning

Credits: 3 (NR)
Introduces past and present interventions that affect supply and demand for health care at community, state, regional, and national levels. Presents health planning and regulatory entities, and discusses strategic and program planning in context of current economic and market conditions.

Prerequisite(s): HAP 301
HAP 410 - Introduction to Health/Medical Practice Management

Credits: 3 (NR)
An introductory course in the leadership and management of ambulatory health service practices and small provider organizations. Content covers a variety of health/medical practice management functions, including administrative systems, operations and strategies for effective management of quality, efficiency and business performance (contracts and marketing), and human resources. Trends in practice integration and affiliations with multiprovider groups and larger enterprises will be covered.

Prerequisite(s): HAP 301

HAP 416 - Leadership and Management of Health Systems I

Credits: 3 (NR)
Introduces theoretical concepts and their application to the leadership and management of effective health care organizations. Explores the structure and function of health-related organizations and selected administrative and operational issues in program development and service design, emphasizing strategies for effective performance management, decision making, and communication.

Prerequisite(s): HAP 301. Completion of HAP 300-level course requirements.

HAP 417 - Leadership and Management of Health Systems II

Credits: 3 (NR)
Explores challenges to providing effective leadership and management of health care organizations and systems of care related to operational issues such as personnel management and labor relations, information management, conflict and goal alignment, financial management, accountability, and quality and safety improvement. Focuses on identification of management skills, technology, and strategy that influence optimal performance and communication between clinicians, administrative staff, and managers.

Prerequisite(s): Completion of HAP 416.

HAP 420 - Management of Project Resources
Credits: 3 (NR)
An introductory course in the management of project resources, including, but not limited to, assessing return on investment for projects and costing out resources needed in project subtasks. Includes hands-on application of project management tools as they are applied in the health-related organization and the health service industry. Also includes a variety of variables that may affect cost control and cost variation, including the impact of finishing projects in shorter time frames than originally planned and activity-based costing.

Prerequisite(s): HAP 360 and HAP 378

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 425 - Health Economics and Policy

Credits: 3 (NR)
An introduction to the role of economics in health care policy. Concepts used by economists to analyze health outcomes, health behaviors, health care markets, health insurance markets, and the role of government. Concepts are linked to current health policy debates. Relevance and limits of the health economics approach to analyzing health issues are discussed.

Prerequisite(s): ECON 103

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

HAP 430 - Process Improvement in Healthcare Organizations

Credits: 3 (NR)
Introduction to the process of quality management in health care organizations. Principles of quality management and guidelines for implementing total quality in health care are discussed, and differentiation between quality assurance and quality management presented.

Prerequisite(s): HAP 301.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

HAP 442 - Introduction to Health Care Politics and Policy

Credits: 3 (NR)
Reviews health care system issues and trends, and economic concepts, ways to understand the critical role of public health policy and the policy-making process in the United States. Identifies the major political institutions and policy processes that shape health policy. Examines the past and present health policy and its impact on changes in the ability of patients to access health services, the practice of health sciences professionals, and the quality and process of care. Explores the role of politics at both the federal and state government in health policy-making and critical aspects of the U.S. health system are compared to those of other countries.
**HAP 445 - Introduction to Health Services Research**

Credits: 3 (NR)
An introductory course for undergraduate students in understanding the basic methods of interdisciplinary health services research and program evaluation in health systems and policy. Emphasis is placed on understanding, assessing and using relevant findings from health services research. The course covers a variety of topics related to policy, management, and program evaluation in health delivery systems.

**HAP 459 - Health Data Standards**

Credits: 3 (NR)
Introduction to prevailing and emerging data standards applicable in health information technology. Students will learn about standard-making organizations, such as HL7 and Healthcare Information Technology Standards Panel (HITSP), and their standardization processes. The structure of and relationship between standard terminologies applicable in healthcare, such as International Classification of Diseases (ICD-10-CM), Logical Observation Identifiers Names and Codes (LOINC) and Systematized Nomenclature of Medicine--Clinical Terms (SNOMED-CT), will be explained.

**HAP 460 - Information Technology Project Management**

Credits: 3 (NR)
Focuses on project management as applied to management of health care information technology projects. Students learn critical path analysis, project resource management, crashing projects, vendor selection, assessment of project quality, and analysis of project risks. Students learn to use media for effective project communication.
HAP 461 - Internet and Web Technology Applications for Healthcare

Credits: 3 (NR)
Introduces students to the major applications of Internet and Web technology in healthcare. Two major applications are studied: online promotion/marketing for consumer-oriented health web sites, and online Personal Health Records (PHR). Students will learn about Search Engine marketing and the practical skill of creating an online health marketing/promotion campaign. They also will learn to create and manage PHR. The technological challenges such as reliability, privacy, security and organizational barriers to adoption are discussed.

Prerequisite(s): HAP 360.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

HAP 462 - Privacy and Security in Health Informatics

Credits: 3 (NR)
Health information security and privacy issues in the current healthcare system. Evaluates methods to achieve privacy and security. Discusses the important role of sound security policies and procedures; looks into technical solutions and non-technical solutions for achieving privacy and security.

Prerequisite(s): HAP 360.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

HAP 465 - Integration of Professional Skills and Issues

Credits: 3 (NR)
Assists students in synthesizing the varied dimensions of their roles as health professionals in a global society. Provides opportunities to examine issues in health care through reflection on the natural and behavioral sciences, humanities and other prerequisite coursework. Selected topics examined through writing, presentation, reading and discussion. (Writing intensive course).

Fulfills general education requirement in synthesis.

Prerequisite(s): Senior standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

HAP 480 - Research Internship in Health and Human Services
Credits: 3 (NR)
The student works as a member of a team engaged in health and human services research and attends a bi-weekly research seminar. Under direction of the course seminar leader and the faculty research mentor, the student will acquire selected research skills and develop introductory research writing and presentation skills.

Equivalent to HHS 480, SOCW 480.

Prerequisite(s): Open only to CHHS majors or students who have completed CHHS minor or certificate courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

HAP 489 - Pre-Internship Seminar

Credits: 1 (NR)
Provides students with guidance and preparation for engaging in the internship.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Spring.

HAP 494 - Special Topics in Health Administration and Policy

Credits: 3 (RT)
Selected topics analyzing specialized areas in health administration and policy.

Notes: Content varies. Lecture, seminar, laboratory, and workshops.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 498 - Health Administration Internship

Credits: 6 (NR)
Provides variety of applied management experiences in a health systems or related organization (field agency), under the direction of a HAP faculty member and a preceptor in the field. Students integrate and apply critical-thinking, project-planning, and management and communication skills in the internship experience and toward completion of an approved internship project.

Prerequisite(s): Open to HAP majors only.

Notes: Taken in last semester of studies. Capstone course involves a two-hour weekly seminar and a 12-hour internship in a health-related organization. Not repeatable for credit.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 12
HAP 499 - Independent Study in Health Administration and Policy

Credits: 1-6 (RT)
Provides individual study of a particular problem area in health administration and policy research, theory development, or education under the direction of faculty.

Prerequisite(s): Permission of instructor and department.

Notes: May be repeated for maximum 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

HAP 511 - Ethics in Public Health

Credits: 3 (NR)
Explores selected ethical issues in public health practice, research, and policy; specific ethical theories identified as the proper basis of public health; relevant ethical concepts and principles and how they inform existing public health policies, practices, and research; and how ethical reasoning can operate in public health practice, research, and policies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

HAP 540 - Introduction to Emergency Preparedness/Disaster Recovery for Health Care Professionals

Credits: 3 (NR)
Introductory course in emergency preparedness and disaster recovery issues for health and human service professionals, using blended learning methods. Introduces policy guiding public and private sector emergency preparedness activities, and provides overview of issues in emergency preparedness infrastructure, needs assessment, and interdisciplinary roles in emergency response operations. Uses knowledge acquired from recent state and federal responses to disasters.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

HAP 594 - Special Topics in Health Care

Credits: 3 (RD)
Selected topics analyzing specialized areas in health care.

Equivalent to GCH 594/NURS 594

Notes: Content varies. Lecture, seminar, laboratory, and workshops.
HAP 601 - E-Commerce and On-line Marketing for Health Services

Credits: 3 (NR)
Explores development of online health services; organization of online businesses; online marketing, financial, and clinical transactions; and venture capital and the IPO process. Explores creating and maintaining web pages and databases. Reviews literature on effect of computer services on patient care and health care organizations. Also reviews examples of both successful and bankrupt technology firms in health care. Student groups draft business plan and develop early version of service proposal.

HAP 602 - Statistics in Health Services Management

Credits: 3 (NR)
An introductory course in basic statistics applied to applications in health systems management. Students use spreadsheet applications to perform a variety of statistical analyses (parametric and nonparametric statistics, including regression) to support program evaluation and managerial decision making in health systems.

Equivalent to HAP 501 (2010-2011 Catalog)

HAP 605 - Introduction to Health Policy

Credits: 3 (NR)
An introductory survey to the process and politics of health policy as it relates to the delivery and financing of health care in the United States. Examines the major public and private sector institutions responsible for health policy development, the interaction of these institutions and their competing interests to create and implement health policies, and public programs providing health coverage and services. Classroom and field experience involved.

HAP 609 - Comparative International Health Systems

Credits: 3 (NR)
Uses Roemer's Model of Health Systems to examine resource allocation, management, and health outcomes in the United States
and around the globe. The structure and functioning of national health systems based on geographic location and governance in developing and developed countries (democracies, monarchies, and communist nations). Resource allocation across the continuum of nations and relationship to national health needs, health status, and longevity are examined.

Notes: An online course in comparative international health care systems.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HAP 610 - Health/Medical Practice Management**

Credits: 3 (NR)
Regulatory pressures, technology, managed care contracting, revenue cycle management, and legal issues are making medical practice management more complex. Physicians groups struggling with these demands are finding a need for sophisticated management. Prepares the student to manage the modern practice by providing a foundation in the leadership and management of ambulatory health services and small provider organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HAP 612 - Maintaining Business Continuity in Health Care**

Credits: 3 (NR)
Considers potential types of catastrophes, their likely impact, and how organizations could continue their mission in the aftermath. Explores interdependences among various components of the health care delivery system, regional health services, disaster planning, business record protection, patient information and information systems protection, manpower planning, professional credentialing, access to supplies and drugs, and financial implications and resources.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HAP 621 - Management of Health Service Organizations**

Credits: 3 (NR)
This is an introductory course in the application of organizational behavior and theories of leadership to the management of interdisciplinary teams and decision making in healthcare organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HAP 632 - Grants Funding and Development**

Credits: 3 (NR)
Provides knowledge of private and public funders, funding mechanisms, tools and resources. Includes content on private and
government funding streams relevant to public health, hospitals and other non-profit health related entities, interpretation of funder motivations and engagement strategies; essential skills for developing externally funded projects; grant proposal writing and grant requirements; assessment skills/strategies and award management/stewardship.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

**HAP 642 - Health Policy Development and Analysis**

Credits: 3 (NR)  
Examines the process and factors that influence formulation, implementation and modification of health policy in the United States, including competing interests and the relationship between public decisions and the market place. Emphasis is on the application of commonly-used frameworks for policy analysis, including contributions from health economics, health services research, and other policy-related disciplines, to contemporary policy issues in health care delivery, organization, and financing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HAP 645 - Introduction to Health Services Research**

Credits: 3 (RD)  
An introductory course in the basic methods of interdisciplinary health services research and program evaluation in health systems and policy. The course covers topics related to policy, management, and program effect and evaluation within health delivery systems, including research design, existing data systems, measurement of quality and basic cost benefit, and effectiveness analysis.

**Prerequisite(s):** HAP 678 (if required in program of study).

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HAP 647 - Regulatory Requirements for Health Care Systems**

Credits: 3 (NR)  
Helps health care professionals understand link between infrastructures of organization and regulatory and accreditation processes for health care organizations. Covers major accrediting agencies and their roles, accreditation principles, and survey process. Focuses on hospitals with reference to ambulatory care, managed care organizations, rehabilitation centers, laboratories, and home health and long-term care facilities. Emphasizes requirements of Joint Commission on Accreditation of Health Care Organization and regulations mandated by Health Care Finance Administration.  

Equivalent to HAP 447, HAP 547 (Catalog 2010-2011)

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall
HAP 650 - Senior Housing Management and Operations

Credits: 3 (NR)
Issues, trends, and practices related to administration of assisted-living and senior housing communities. Emphasizes budgeting; staffing; hospitality services; resident care and risk management indicators; and evaluation of demographic, cultural, and regulatory environments affecting industry.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

HAP 651 - Senior Housing Sales and Marketing

Credits: 3 (NR)
Introduction and analysis of sales and marketing practices within senior housing environments, including but not limited to Active Adult (55+), assisted living, Alzheimer’s assisted living, and Continuing Care Retirement Communities (CCRC’s). Topics include a review of the role of marketing in health care, the senior housing consumer and product, the development of marketing plans, and administrative management of the promotion, lead management, and sales process.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer

HAP 652 - Essentials of Health Insurance and Managed Care

Credits: 3 (NR)
Survey course in US health insurance and managed care. Provides an overview of the different types of health insurers and managed care organizations, with content on sales and marketing, provider network management and reimbursement, medical and quality management, claims processing, member services, IT and operational finance. Policy, laws and regulations affecting the industry will also be addressed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 661 - Policy Development and Analysis for Community Health Programs

Credits: 3 (NR)
Prepares students to critically analyze issues and develop skills pertinent to effective policy development for community and family public health programs. Explores what constitutes a vulnerable population and examines current government programs and policies supporting these programs for such populations. Recent case examples ground students in current issues faced by community groups and other health interests.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
HAP 662 - Health Policy for Elders and People with Disabilities

Credits: 3 (NR)
An introduction to health policy, health economics, and the aging of the American population. Focuses on the effect of chronic illness and disability on health care costs and provides students with skills in policy process and analysis as applied to acute care, long-term care, and health promotion for elders and people with disabilities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

HAP 678 - Introduction to the U.S. Health System

Credits: 3 (NR)
Explores the U.S. Health System focusing on historical development, current configuration and possible future direction. Includes study of health system development, key influencers, accessibility, financing, changing components and effects system has on patients, providers, financiers, employers, government, insurers and society. Role of population health management and public health is explored, including impact of social, cultural, economic, and environmental factors on health care systems and practices.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 680 - Applied Public Health Leadership and Management

Credits: 3 (NR)
Survey course in leadership, management, and planning applied to public health systems. Students apply theoretical knowledge from a variety of disciplines relevant to development and implementation of public health policy, regulatory directives, public health program planning and management (including human resources and financial management), and the design and evaluation of public health services/functions. Content includes strategies for ensuring access to essential public health services and use of evaluation and monitoring systems to ensure the safety, efficiency, and effectiveness of local public health programs/systems. Course emphasizes leadership, communication, systems thinking, data-driven decision making, and ethical practice in public health systems.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 686 - Quality Improvement in Health Services

Credits: 3 (NR)
Examines how improved work processes lead to quality improvement. Explores contribution of operations research and quality management to improve delivery and production of health services and business processes from the perspective of health care managers.
HAP 690 - Independent Study

Credits: 1-3 (RD)
In-depth studies of selected area of health science theory, research, or practice under direction of faculty.

Notes: May be repeated for a maximum of 3 credits.

HAP 700 - Introduction to Health Informatics

Credits: 3 (NR)
Introduces the study of data and information flow in healthcare delivery. Covers the history and evolution of methods in information management and the role and contributions of an inter-disciplinary health informatics workforce.

Corequisite(s): HAP 678 or permission of instructor.

HAP 701 - Health Data: Vocabulary and Standards

Credits: 3 (NR)
Explores the challenges of representing health care data using standardized vocabulary in health information systems. Topics include data standards and semantics, policy, and theory and practice of standardization.

Corequisite(s): HAP 678, or permission of instructor.

HAP 702 - Managerial Accounting in Health Care

Credits: 3 (NR)
Practical examination of controllership function in health care organizations and systems (profit and nonprofit), with emphasis on policy formulation and evaluation of performance, including cost methods and systems; measurement criteria; and managerial planning, methods, and techniques.
Prerequisite(s): Graduate-level statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HAP 703 - Financial Management in Health Systems**

Credits: 3 (NR)
Examines tools and methods of financial management in health care organizations and systems, with emphasis on allocation and use of funds. Analyzes costs and constraints of alternative source of funds, and applies financial decision instruments and effect on operational management and market value of entity.

Prerequisite(s): Graduate-level statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HAP 704 - Contemporary Issues in Health Systems Management**

Credits: 3 (NR)
Analyzes management theory and practice from recently evolving works that identify, analyze, and resolve strategic organizational problems and issues in health care systems. Applies leadership strategy to effectively manage variety of critical issues, including organizational development, change management, human relations and diversity, quality management for organizational and clinical effectiveness, technology, competing priorities, conflicting constituencies, delivery system redesign, and health services research.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HAP 705 - Strategic Management and Marketing in Health Care**

Credits: 3 (NR)
Explores role of strategic management and marketing in healthcare organizations and process used to formulate, implement, and evaluate cross-functional decisions to achieve their objectives. Reviews formulation of strategic plans to address strengths, weakness, opportunities and threats facing organizations from both external and internal environments. Considers type of environmental forecasts and competitor intelligence healthcare organizations need to make timely and adaptive strategic and marketing decisions. Addresses conditions necessary for successful strategic execution.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HAP 706 - Integrated Health Systems Management**
Credits: 3 (NR)
Explores emerging structures for financing and delivery of comprehensive health services in integrated health systems. Covers successful development and management of alliances, provider hospital organizations, and managed care systems with emphasis on strategies for vertical integration, community partnering, contract negotiation, governance, and management of antitrust situations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 709 - Health Care Databases

Credits: 3 (NR)
Introduces design and use of health and medical databases, providing hands-on experience. Explores uses of medical record systems. Includes review and analysis of databases and database management systems. Examines application of databases to clinical and managerial transaction.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 710 - Inferential Statistics in Health Services Research and Management

Credits: 3 (NR)
Introduction and practical application of advanced statistical analyses and their use/application in health services (research, management, policy analysis) using various software applications (STATA, Microsoft Excel and Access, SAS, SPSS, MINITAB). Topics include analysis of variance (one and two way) and design of experiments, multiple regression, model building, chi-square and the analysis of contingency tables, and nonparametric statistics.

Prerequisite(s): Graduate-level statistics course.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

HAP 712 - Topics in Public Policy

Credits: 3 (NR)
Presents selected topics current in public policy related to health care and health care administration.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 713 - Project Management in Health Information Technology

Credits: 3 (NR)
Applies body of knowledge in project management to the implementation of information technology and systems in healthcare
organizations. Examines how tasks such as needs assessment, project planning, project cost analysis, risk management, and management of personnel are readily included in the use of health information systems.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

**HAP 714 - Ethical Issues in Health Administration and Policy**

Credits: 3 (NR)  
Seeks to explore selected ethical issues in health administration and policy and decision options by understanding ethical theories, concepts, and principles and their role and selective application in the development, organization, and administration of health policy, as well as the organization and delivery of health services. Students will learn specific ethical concepts, theories, and principles, how these inform existing health policies and practices, and how ethical reasoning can operate in the policy process and administrative decisions in the health delivery systems.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HAP 715 - Health Economics**

Credits: 3 (NR)  
Emphasizes understanding of economic efficiency in the U.S. health system. Microeconomic methods examine markets and resources in health care. Health care examined as commodity. Explores demand for health and medical care services, provider behavior, and function and behavior of insurance markets. Topics include government role, financing arrangements, insurance reform, rationing, price regulation, and provider competition.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HAP 720 - Health Data Integration**

Credits: 3 (NR)  
Students learn to manipulate large databases, create link table queries, write SQL application programs, understand sources of data conflicts, and identify methods of integrating ODBC databases with legacy data. Covers data warehousing, methods of analyzing large databases, including Bayesian belief networks and machine learning in health care context. Features semester long data integration group project.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HAP 727 - Program Evaluations in Health Care**
Methods of evaluating health and social programs, including anthropological case studies, decision analytic and quasi-experimental approaches. Emphasis is placed on using methods of continuous quality improvement and benchmarking exchanges in evaluating multisite programs. Assess cost effectiveness of programs (including assessment of patient census, employee activities and program outcomes). Evaluation of health care interventions, rate setting, and managed care are discussed.

**HAP 730 - Health Care Decision Analysis**

Credits: 3 (NR)
Students analyze practice patterns and find optimal methods of improving them. Uses decision analysis and failure mode analysis in health care settings. Students integrate scientific evidence, patients' preferences, and experts' opinions to identify optimal alternatives.

Prerequisite(s): Graduate-level statistics course.

**HAP 735 - Risk Analysis in Health and Bioscience**

Credits: 3 (NR)
Students build and interpret causal model of risks and test the accuracy of them against extant incidence reports using risk analysis models, risk analysis life cycle, as well as methods of evaluating the validity and reliability of risk analysis. Bayesian probability models, probabilistic risk analysis, root-cause analysis, and failure model analysis are covered. Includes applications to terrorism, unauthorized disclosures, and patient safety.

Prerequisite(s): HAP 730 or equivalent approved by instructor.

**HAP 740 - Management of Health Information Systems**

Credits: 3 (NR)
Introduces health and medical information systems with emphasis on systems analysis and design to support managerial and clinical communications and decision making. Explores trends and innovations in information technology and systems, focusing on managerial oversight of health and medical information systems. Explores contemporary management strategies for information systems personnel.
HAP 745 - Health Care Security Policy

Credits: 3 (NR)
Focuses on health security and privacy policy and compliance issues. Students will develop policies for the type of threats faced by facilities. The legal and business policies for facility, personnel, travel, information, and patient security will be discussed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 746 - Health Policy Leadership

Credits: 3 (RD)
Identifies and assesses critical leadership skills in many areas of health policy making necessary for health care professionals. Teaches individuals how to link health issues with policy development and pursue appropriate strategies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 750 - Legal Issues in Health Administration

Credits: 3 (NR)
Prepares health professionals to understand legal principles, statutes, regulations, and case law related to managing health care organizations and health professionals’ practice. May compare legal health care issues from domestic and international perspectives.

Equivalent to HHS 750 (2010-2011 catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

HAP 752 - Advanced Health Information Systems

Credits: 3 (NR)
Provides in-depth analyses of the challenges of supporting clinical providers across all settings through information integration in electronic health records (EHR). Analyzes architectural trends, workflow redesign, and implementation strategies. Attention is given to life cycle management strategies for health information systems. Laboratory time provides learning experience in various allied situations.

Prerequisite(s): HAP 709, or permission by the instructor or Program Coordinator.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
HAP 755 - Analysis of Causality in Health Services Research

Credits: 3 (NR)
Covers philosophical and statistical problems with analysis of causes as separate and distinct from associations. Topics discussed include structural modeling, self selection, risk adjustment, propensity scoring, and Bayesian networks. Students examine real health care databases and the pitfalls of causal inferences. Special attention is made to investigation of causes of outbreaks and illness.

Prerequisite(s): Graduate-level statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 760 - Philosophy of Science in Health Services Research

Credits: 3 (NR)
An introductory course on the theory and philosophy of science and humanism that relate to the design and conduct of health services research. The course examines selected theories on the nature of reality (ontology), the justification of knowledge claims (epistemology), and how knowledge is constructed (methodology) in design and analysis of health services research.

Prerequisite(s): Admission to a doctoral program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 762 - Cost-Effectiveness for Health Care Management and Policy Decisions

Credits: 3 (NR)
A survey course in health services research methods for the application of economic evaluation techniques used in health care policy analysis and clinical or administrative applications for health care service planning and evaluation. Introduces methods applied to health care technology assessment, medical decision making, health resource allocation, and policy-making.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 764 - Health Policy and Government Payment Systems for Health Care Services

Credits: 3 (NR)
Examines the rationale for government intervention in provider payment and explores the current policy issues and politics of major government provider payment systems, including Medicare and Medicaid, and examines options for managing these programs more effectively. The course will "follow the money" as it flows through government and provider payment systems, model potential changes in such systems, and identify policies for improving the operation of these programs and payment systems.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
HAP 765 - Methods for Health Policy Analysis

Credits: 3 (NR)
Explores conceptual, analytic, and technical methods/approaches used in health policy analysis and planning. Students will learn to select from among alternative methods for applied concept modeling, graphical data presentation, needs assessment, goal clarification, group decision methods, and a variety of quantitative applications and frameworks for evaluating policy impact.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 766 - Policy Implementation and Health System Management Dilemmas

Credits: 3 (NR)
Analyzes selected public policies and regulations and the impact of implementation and compliance/noncompliance on health care systems and organizations. Examines management responsibilities, challenges, and dilemmas (fiduciary and ethical) of implementing selected policies and regulations (promulgated or proposed).

Prerequisite(s): HAP 703 or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 770 - Medical Decision Making and Decision Support Systems

Credits: 3 (NR)
Introduces the complex subject of medical decision making. Examines systematic approaches to decision making. Explores principles governing the design, application, and maintenance of clinical decision support systems. Laboratory time provides learning experience in various applied situations.

Prerequisite(s): HAP 701 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1
When Offered: Spring

HAP 780 - Data Mining in Health Care

Credits: 3 (NR)
An introductory course to data mining and knowledge discovery in health care. Methods for mining health care databases and synthesizing task-oriented knowledge from computer data and prior knowledge are emphasized. Topics include fundamental concepts of datamining, data preprocessing, classification and prediction (decision trees, attributional rules, Bayesian networks), constructive induction, cluster and association analysis, knowledge representation and visualization, and an overview of practical tools for discovering knowledge from medical data. These topics are illustrated by examples of practical applications in health care.
**HAP 789 - Pre-Practicum Seminar**

Credits: 1 (NR)
Provides students with guidance and preparation for engaging in the capstone practicum.

**HAP 790 - Capstone Practicum in Health Systems Management**

Credits: 3 (NR)
Field practicum in health systems management where students function as an integral member of an organizational entity to complete a non-thesis project while continuing to build skills in leadership, critical thinking and systematic problem analysis.

**Prerequisite(s):** All coursework in the major. Practicum hours required in addition to class meetings. Permission of instructor required.

**When Offered:** Fall, Spring, Summer

**HAP 791 - Practicum in Public Health**

Credits: 3 (NR)
The practicum provides students with an in-depth supervised experience in an approved public health organization. The practicum will require students to complete a project related to an actual public health issue that is a focus within the organization.

**Prerequisite(s):** Students must complete all of the core MPH coursework (epidemiology, biostatistics, health education, environmental health, and public health administration) and pass the MPH comprehensive exam with a 70% or better.

**When Offered:** Fall, Spring, Summer

**HAP 792 - Practicum in Health Policy**
The practicum provides students with an in-depth supervised experience in an approved health policy related organization. The practicum will require students to complete a project related to an actual public health policy issue that is a focus within the organization.

Notes: Students must complete all the core MSHMP coursework prior to registering for HAP 792. Only students enrolled in the MSHMP concentration in Health Policy program may register. Proposal of practicum experience and selection of practicum location and preceptor must be determined one semester prior to taking the practicum.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

HAP 799 - Master's Thesis

Credits: 1-6 (RD)
Provides students with skills to develop their research proposal, conduct their research, and complete their thesis in a relevant field of study.

Prerequisite(s): Admission to one of the master’s programs in the department and permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit only
When Offered: Fall, Spring, Summer

HAP 820 - Analytic Models in Health Services Management, Policy, and Research

Credits: 3 (NR)
An advanced statistics course in applied linear and multiple regression analysis, including polynomial regression, indicator variables and covariance analysis, model selection and validation, methods for measurement errors, diagnostic methods for outliers, influence and multicollinearity, nonlinear regression, logistic regression with non-normal distributions, correlations, and time-series analysis and forecasting as used in health services administration research and policy analysis.

Prerequisite(s): HAP 710 or equivalent graduate statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HAP 821 - Analysis of Categorical Data in Health Policy and Administration

Credits: 3 (NR)
An advanced statistics course in analysis of categorical data. Topics include tests and measures of association for contingency table analysis, including chi-square, odds ratio, relative risk, comparative trials, analysis of categorical data with matched samples, log-linear models, and logistic regression. Econometric models involving categorical variables could also be covered.

Prerequisite(s): HAP 710 or equivalent graduate statistics course.
HAP 822 - Research Designs and Analysis in Pharmaceutical and Health-Related Clinical Trials

Credits: 3 (NR)
A survey course that introduces students to the design and management of clinical trials research and pharmaceutical research and development, including drug development and FDA drug approval. This course also covers a variety of biostatistical methods as they apply to biomedical and biotechnology industry research with human subjects.

Prerequisite(s): HAP 710 or equivalent graduate statistics course.

HAP 866 - Politics of Influencing Health Care Policy

Credits: 3 (NR)
Focuses on process of formulating health care policy and analyzing implications for nursing, administration in nursing, and education and nursing service. Examines current and impending health issues, legislative process, and program implementation evaluation.

HAP 868 - Advanced Research Seminar in Health Policy Analysis

Credits: 3 (NR)
Seminar on advanced research methods that analyzes theoretical and analytic foundations to critique health services research and health policy analysis. Students synthesize, integrate, and apply theoretical knowledge and advanced skills relevant to health services research, policy analysis, and program evolution.

Prerequisite(s): HAP 703 or equivalent or permission of instructor.

Notes: Limited to doctoral students having completed core courses in statistics and research design, or permission of instructor.

Health and Human Services (HHS)

Offered by the Health and Human Services
HHS 270 - Applied Human Anatomy and Physiology I

Credits: 4 (NR)
Fast-paced, condensed course covering basics of human anatomy and principles of physiology.

Prerequisite(s): Permission of college.

Notes: Must be taken in sequence with HHS 271. Some knowledge necessary in basic biology, chemistry, and cell structure and function. Those lacking this background will be assigned reading during first class to catch up. Successful students are capable of independent work and have many hours to devote to studying anatomy and physiology outside classroom.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HHS 271 - Applied Human Anatomy and Physiology II

Credits: 4 (NR)
Fast-paced, condensed course covering basics of human anatomy and principles of physiology.

Prerequisite(s): Permission of college.

Notes: Must be taken in sequence with HHS 270. Some knowledge necessary in basic biology, chemistry, and cell structure and function. Those lacking this background will be assigned reading during first class to catch up. Successful students must be capable of independent work and have many hours to devote to studying anatomy and physiology outside classroom.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

HHS 432 - Healthy Aging

Credits: 3 (NR)
Offers a broad perspective of normal aging in the older adult, and the impact of chronic disease and psychosocial and cultural factors on the aging process.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

HHS 480 - Research Internship in Health and Human Services

Credits: 3 (NR)
The student works as a member of a team engaged in health and human services research and attends a bi-weekly research seminar. Under direction of the course seminar leader and the faculty research mentor, the student will acquire selected research
skills and develop introductory research writing and presentation skills.

Equivalent to SOCW 480, HAP 480.

Prerequisite(s): Open only to CHHS majors or students who have completed CHHS minor or certificate courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Spring

HHS 597 - Approaches to Quantitative Data Analysis in Health Care Research

Credits: 3 (NR)
Examine univariate and bivariate statistical procedures appropriate for analyzing quantitative health care research data. Includes selecting, applying, and interpreting data analysis procedures.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HHS 648 - Aging and Health

Credits: 3 (NR)
Provides an overview of normal aging and explores factors that affect health and well being in older adults; demonstrates strategies for maintaining health and managing chronic illness in older adults; examines common misconceptions about aging and healthcare issues; and explores the process of normal aging and the presentation of common health conditions in older adults.

Equivalent to NURS 648

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

HHS 830 - The Scholarship of Writing

Credits: 3 (NR)
Boyer’s framework for scholarship shapes the presentation of theory related to writing for scholarship. Students apply research in composition to inform writing for a variety of scholarly purposes, including overall conceptualization of research papers and proposals, writing for publication, and writing for scientific, creative, quantitative, and qualitative research. Seminar and intensive writing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Health Education (HEAL)
HEAL 110 - Personal Health

Credits: 3 (NR)
Focuses on individual health improvement by studying mental/emotional well-being, fitness, nutrition, drug abuse prevention, consumerism, safety and other topics.

Notes: One section of HEAL 110 will be dedicated as Distance Education while remaining sections will be traditional classroom, 100% face-to-face.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

HEAL 205 - Principles of Accident Causation and Prevention

Credits: 4 (NR)
Investigates safety-related problems. Emphasizes fire, home, occupational, and vehicle safety; identification, care, and treatment of various medical emergencies; and violence and property crime prevention.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

HEAL 220 - Dimensions of Mental Health

Credits: 3 (NR)
Focuses on integrating behavioral and sociocultural factors in studying mental health.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 230 - Introduction to Health Behavior

Credits: 3 (NR)
Introduces health behavior in context of health psychology. Explores various theoretical models to understand health, illness and sick-role behaviors. Studies health and disease from a biopsychosocial perspective. Examines means of preventing and treating health problems.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
HEAL 310 - Drugs and Health

Credits: 3 (NR)
Analyses drug use, with emphasis on positive aspects, and presents alternatives to drug misuse and abuse.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 312 - Health and Wellness Choices

Credits: 3 (NR)
Actively involves students in becoming managers of their personal health and well-being throughout life span. Consistent with Healthy People 2000 goals for nation. Emphasizes lifestyle activity and fitness, behavioral change, and maintenance.

Notes: May be taken by nonmajors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 314 - Community Health Issues and Strategies

Credits: 3 (NR)
Explores health promotion and disease prevention issues in a range of community health settings: schools, colleges, governmental agencies, municipal organizations, private sector workplaces, community service groups, and health care centers. Issue exploration will be global, national, and local levels.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 323 - Program Leadership and Evaluation

Credits: 3 (NR)
Covers leadership and evaluation of health, fitness, and recreation programs. Uses computer technology to study evaluative aspects of program planning and administration.

Prerequisite(s): PRLS 310 or permission of instructor Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 325 - Health Aspects of Human Sexuality

Credits: 3 (NR)
Covers biological, behavioral, and sociocultural factors in human sexual behavior.
HEAL 327 - Women's Health

Credits: 3 (NR)
Examines health issues unique to women, including health care, food and exercise, reproductive and gynecological issues, chronic diseases, and issues of violence.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 330 - Nutrition

Credits: 3 (NR)
Assesses dietary habits and patterns in relation to nutrient requirements. Emphasizes weight control, diet and fitness, and current nutritional controversies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 350 - Interventions for Populations and Communities at Risk

Credits: 3 (NR)
Identifies culturally, physically, emotionally, mentally, and demographically diverse populations and communities at risk. Covers implications for developing innovative programs and role of HFRR interventions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 370 - Health Determinants and Status

Credits: 3 (NR)
Focuses on determining person's health status and health behavior change strategies. Covers skills acquisition in health-risk appraisal, screening, and related instruction.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 372 - Health Communication
Applies research-based models and theories of health assessment and promotion at individual, organizational, agency, and community levels. Uses communication approaches and skills in context of behavior change strategies, including policy and program development.

**HEAL 402 - Introduction to Driver Education Instruction**

Credits: 3 (NR)
Introduces vehicle operator's tasks in highway transportation system. Provides essential knowledge and skills to instruct driver education.

**HEAL 403 - Driver Education Practice and Administration**

Credits: 3 (NR)
Applies driver education to simulated and actual driving environments. Provides essential knowledge and skills to administrate driver education.

**HEAL 405 - Teaching Methods in Health Education (K-12)**

Credits: 3 (NR)
Covers content, methodology, and resource materials in teaching health education for physical education teaching majors.

Prerequisite(s): BSED status or permission of instructor

Notes: Field experience required.

**HEAL 430 - Seminar in Exercise Science and Health Promotion**

Credits: 3 (NR)
Provides overview of contemporary and often controversial health issues with analysis of selected problems of current concern to society.
Prerequisite(s): 90 hours

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 450 - Epidemiology and Environmental Health

Credits: 3 (NR)
Covers incidence, distribution, and causes of diseases and injuries in human populations. Emphasizes essential diagnostics and planning for community health problem-solving with environmental consideration.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

HEAL 470 - Community Health Systems

Credits: 3 (NR)
Examines complexities of community health and community health system infrastructure. Focuses on planning and navigating multi system agency environment, including population and subpopulation health.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEAL 480 - Special Topics

Credits: 1-3 (RD)
Presents selected health issues or problems. Focuses on applying information to education programs.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

HEAL 490 - Internship

Credits: 12 (NR)
Provides directed experience in observing and participating in health promotion and exercise science programs at community agencies, health care centers, and private sector organizations.

Prerequisite(s): 90 credits or permission of instructor

Notes: See internship manual for specific concentration requirements. Minimum period of 10 to 12 consecutive weeks.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 12
Grading: Satisfactory/No credit
HEAL 499 - Independent Study in Health Education

Credits: 1-3 (NR)
Studies problem area in health education research, theory, or practice under faculty direction.

Prerequisite(s): 90 credits or permission of instructor

Notes: May be repeated, but no more than 3 credits may be earned.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

HEAL 516 - Program Development and Resources in Health Education

Credits: 3 (NR)
Open to licensed and provisionally licensed health and physical education teachers in the commonwealth of Virginia and students in ASTL physical education program. Focuses on program development, health content, methodology, and resources for teaching preK-12 health education.

Notes: Distance learning course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Hebrew (HEBR)

Offered by the College of Humanities and Social Sciences

HEBR 101 - Elementary Hebrew I

Credits: 3 (NR)
Designed for students with no knowledge of Hebrew. Introduction including grammar, vocabulary, oral skills, listening comprehension, and reading.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

HEBR 102 - Elementary Hebrew II

Credits: 3 (NR)
Continuation of HEBR 101.

Prerequisite(s): HEBR 101 or equivalent.
HEBR 150 - Introduction to Biblical Hebrew

Credits: 3 (NR)
Introduces basic vocabulary, grammar, and development of reading skills with introduction to religion and culture of ancient Israel that produced the Hebrew Bible/Old Testament.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEBR 160 - Readings in Biblical Hebrew

Credits: 3 (NR)
Continuation of HEBR 150 to increase students' proficiency in vocabulary and understanding of morphology and syntax. Selected passages from Hebrew Bible read; students introduced to text formation and analysis.

Prerequisite(s): HEBR 150 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HEBR 201 - Intermediate Hebrew I

Credits: 3 (NR)
Further development of skills acquired in HEBR 101 and 102, including grammar, oral expression, listening comprehension, reading, and writing.

Prerequisite(s): HEBR 102 or equivalent.

Notes: Lab work required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

HEBR 202 - Intermediate Hebrew II

Credits: 3 (NR)
Continuation of HEBR 201.

Prerequisite(s): HEBR 201 or equivalent.
History (HIST)

Offered by the College of Humanities and Social Sciences

HIST 100 - History of Western Civilization

Credits: 3 (NR)
History of Western civilization from ancient Mediterranean origins through medieval and modern development of Europe to contemporary world.

Fulfills general education requirement in western civilization/world history.

Notes: Students who take HIST 100 may not receive credit for HIST 101 or HIST 102.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 101 - Foundations of Western Civilization

Credits: 3 (NR)
Evolution of Western culture from ancient Mediterranean world to formation of modern Europe in 17th century.

Notes: Students may not receive credit for HIST 101 if they have taken HIST 100.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 102 - Development of Western Civilization

Credits: 3 (NR)
History of Western institutions and ideas from 17th century to the present.

Notes: Students may not receive credit for HIST 102 if they have taken HIST 100.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 121 - Formation of the American Republic
Social, political, economic, and intellectual growth of American institutions from colonization through Reconstruction.

Fulfills general education requirement in social and behavioral science.

**Notes:** Students may not receive credit for HIST 121 if they have taken HIST 120.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 122 - Development of Modern America**

Credits: 3 (NR)  
History of the United States since 1877.

Fulfills general education requirement in social and behavioral science.

**Notes:** Students may not receive credit for HIST 122 if they have taken HIST 120.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 125 - Introduction to World History**

Credits: 3 (NR)  
Analytical approach to world history overview that surveys major features of principal existing civilizations of world, as originally formed and as altered by key global processes including forces of modernity.

Fulfills general education requirement in western civilization/world history.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 130 - History of the Modern Global System**

Credits: 3 (NR)  
Provides understanding of processes that have shaped modern world. Beginning in 1500, traces developments that reorganized peoples, reshaped cultures, and generated new economies in interaction between Western and non-Western societies. Focuses on Western and non-Western regions of world, and their participation in global networks resulting from mercantile expansion, industrial revolution, imperialism, nationalism, and legacies in postcolonial period.

Fulfills general education requirement in global understanding.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
HIST 200 - Freshman/Sophomore Seminar in U.S. History

Credits: 3 (NR)
Focuses on skills, methods of learning, and subject matter to introduce discipline of history.

Prerequisite(s): Freshman or sophomore standing.

Notes: Topics vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 201 - Freshman/Sophomore Seminar in European History

Credits: 3 (NR)
Focuses on skills, methods of learning, and subject matter to introduce discipline of history.

Prerequisite(s): Freshman or sophomore standing.

Notes: Topics vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 202 - Freshman/Sophomore Seminar in Global History

Credits: 3 (NR)
Focuses on skills, methods of learning, and subject matter to introduce discipline of history.

Prerequisite(s): Freshman or sophomore standing.

Notes: Topics vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 251 - Survey of East Asian History

Credits: 3 (NR)
Surveys history of China and Japan from prehistoric times to ca. 1600.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.
HIST 252 - Survey of East Asian History

Credits: 3 (NR)
Surveys history of China and Japan from early modern times (ca. 1600) to present.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

HIST 261 - Survey of African History

Credits: 3 (NR)
Focuses on the sub-Saharan region and examines evolving systems of kinship power, spirituality, and slavery. Explores the interactions between Africans and global influences from the religions of the book and colonialism to the politics of development and continuities and changes in production. HIST 261 surveys African history from the earliest times to 1800. HIST 262 surveys African history from 1800 to the present.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

HIST 262 - Survey of African History

Credits: 3 (NR)
Focuses on the sub-Saharan region and examines evolving systems of kinship power, spirituality, and slavery. Explores the interactions between Africans and global influences from the religions of the book and colonialism to the politics of development and continuities and changes in production. HIST 261 surveys African history from the earliest times to 1800. HIST 262 surveys African history from 1800 to the present.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.
**HIST 271 - Survey of Latin American History**

Credits: 3 (NR)
Surveys colonial era to 1825. Emphasizes interactions of United States, Latin America.

Fulfills general education requirement in global understanding.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 272 - Survey of Latin American History**

Credits: 3 (NR)
Surveys development of independent Latin America since 1825. Emphasizes interactions of United States, Latin America.

Fulfills general education requirement in global understanding.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 281 - Survey of Middle Eastern Civilization**

Credits: 3 (NR)
Survey of Middle Eastern history from rise of Islam to present, emphasizing processes that led to emergence of economic, cultural, social, and political institutions that characterize region today. Surveys period from rise of Islam in 570 to medieval period (ca. 1258)

Fulfills general education requirement in global understanding.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 282 - Survey of Middle Eastern Civilization**

Credits: 3 (NR)
Survey of Middle Eastern history from rise of Islam to present, emphasizing processes that led to emergence of economic, cultural, social, and political institutions that characterize region today. Surveys medieval period to present.

Fulfills general education requirement in global understanding.

**Notes:** Fulfills the college requirement in non-Western culture.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 298 - History and the Web

Credits: 1 (NR)
Introduces techniques and methods of creating historical web sites. Overview of historical resources on web, including Internet archives, hypertext scholarly articles, and online exhibits. Examines new narrative and interpretive possibilities for doing history.

Notes: Combines lecture, lab.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

HIST 299 - Databases for Historians

Credits: 1 (NR)
Introduces techniques and methods to create historical databases. Overview of web, CD-ROM, and personal databases helpful for historical research. Examines database as electronic archive and interpretive and analytical tool.

Notes: Combines lecture and lab.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

HIST 300 - Introduction to Historical Method

Credits: 3 (NR)
Introduces research skills and methods, as well as historical interpretation, culminating in written and oral presentations.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

Prerequisite(s): History majors with 30 credits or permission of instructor.

Notes: Topics vary according to instructor. History majors strongly urged to take HIST 300 early in their program of upper-level courses. Grade of C or better is required to graduate with BA in history.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 301 - Classical Greece
Credits: 3 (NR)
Political, social, economic, and cultural history of classical Greece from development of the city-state through 5th century.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 302 - Classical Rome

Credits: 3 (NR)
Political, social, economic, and cultural history of classical Rome from founding of the city through fall of Roman republic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 304 - Western Europe in the Middle Ages

Credits: 3 (NR)
Survey of development of European society from collapse of Roman rule in 5th century to advent of Black Death in 14th century. Emphasizes political, social, cultural, and intellectual growth of society that developed from Roman, Catholic, and Germanic roots.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 305 - The Renaissance

Credits: 3 (NR)
Survey considering Renaissance as phenomenon rather than chronological period. Emphasizes growth of humanism in Italy in 14th and 15th centuries, development of new political concepts, and laicization of society. Includes transmission of these developments to transalpine Europe in late 15th and 16th centuries.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 306 - The Reformation

Credits: 3 (NR)
Late medieval ecclesiastical conditions and reform movements, late scholasticism, Protestant Reformation, Catholic Reformation, dynastic rivalries, and religious wars. Concludes with Peace of Westphalia.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
HIST 307 - Old Regime and Revolutionary Europe

Credits: 3 (NR)
Political, social, economic, and cultural history of Europe from 1648 to 1815. Crisis of authority, consolidation of the state, absolutism, colonial expansion, the Scientific Revolution and the Enlightenment, and the French Revolution and Napoleon.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 308 - Nineteenth-Century Europe

Credits: 3 (NR)
History of Europe from Congress of Vienna to outbreak of World War I.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 309 - Europe in Crisis: 1914-1948

Credits: 3 (NR)
Two world wars, the Great Depression, and political and cultural revolutions transformed Europe as never before. Explores causes and consequences of these tumultuous events, and concludes with consideration of reconstruction that caps period.

Prerequisite(s): 45 credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 312 - Nationalism in Eastern Europe

Credits: 3 (NR)
Examines history of modern Eastern Europe from mid-19th century through collapse of communist regimes in 1989, and includes focus on Yugoslav wars of 1990s. Nationalism provides organizing theme; topic approached through literature, political, social, cultural, and new media sources. Class sessions emphasize discussion of central issues and sources.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 314 - History of Germany

Credits: 3 (NR)
Political, diplomatic, economic, social, and cultural development of Germany from dissolution of Holy Roman Empire to present.
HIST 322 - Modern Britain

Credits: 3 (NR)
History of Britain from mid-18th century to present. Focuses on social, political, and economic transformations of industrialization; culture of 19th-century industrial society; problems of late 19th-century economic competition and imperialism; creation of welfare state; and experience of post-World War II political, social, and economic realignments.

HIST 327 - The Soviet Union and Russia Since World War II

Credits: 3 (NR)
Analyzes the Soviet Union, the Cold War "enemy" of the United States, from victory in World War II under Joseph Stalin through collapse in 1991. Studies the fifteen independent countries that emerged from the Soviet collapse, including Russia, the Baltic States, Ukraine, Belarus, Moldova, Central Asia, and the Caucasus, which continue to influence world politics and culture today.

HIST 328 - Rise of Russia

Credits: 3 (NR)
Political, social, and cultural development of Russia from early times to the end of the 19th century.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

HIST 329 - Modern Russia and the Soviet Union

Credits: 3 (NR)
Russia and the Soviet Union from the early 20th century to the present. Focuses on the Russian Revolution and the political, social, cultural, and economic developments of the Soviet and post-Soviet eras.

Fulfills general education requirement in global understanding.
Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 331 - Postwar United States, 1945-1973

Credits: 3 (NR)
Examines political, cultural, and economics history in the three decades after 1945. Themes include the emergence of the civil rights movement and feminism; the domestic and international events of the Cold War, especially the Vietnam War; and the rise and fall of the presidency's prestige in the years of the Great Society and Watergate.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 332 - United States since 1973

Credits: 3 (NR)
Examines political, cultural, and economics history since the end of the Vietnam War. Themes include the shifting political economy of the country during the resurgence of conservatism, the political debates over culture and identity, and the waning of the Cold War and its replacement with other international concerns.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 333 - The Automobile in the United States

Credits: 3 (NR)
Examines the biography of one of the most important characters in twentieth-century U.S. history: the automobile. Embraces the histories of business, policy, labor, the environment, technology, and culture, and seeks a holistic understanding of the role of the car in American life.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 335 - The African American Experience in the United States: African Background to 1885

Credits: 3 (NR)
History of African American experience in United States including African origins; trans-Atlantic slave trade; development of slavery in colonial, revolutionary, and antebellum periods; abolitionist movements; and African American participation in Civil War and during Reconstruction.

Prerequisite(s): 6 credits of history, or permission of instructor.
HIST 336 - The African American Experience in the United States: Reconstruction to the Present

Credits: 3 (NR)
History of African American life in post-slavery America, and rise and consequences of racial segregation in 19th and 20th centuries. Examines African American response to continued racial inequality and repression. Covers great migration, urbanization, black nationalism, and civil rights era, as well as contemporary debates about race.

Prerequisite(s): 6 credits of history or permission of instructor.

HIST 337 - Race and Gender in American Sports

Credits: 3 (NR)
Examines how ideas about race and gender have affected sports in America from late 19th century to the 1980s. Will also consider how athletes and sporting activities have shaped American racial and gender paradigms.

HIST 338 - History of College Athletics

Credits: 3 (NR)
Examines America's unique blend of higher education and sports from 1870s to modern collaborations between college athletic programs and America's media outlets.

HIST 339 - History of Baseball

Credits: 3 (NR)
Examines development of baseball in U.S. context of labor, intellectual, economic and political events including racial segregation.
HIST 341 - History of Sport in the United States

Credits: 3 (NR)
Examines the roots of American sport in colonial play and recreation, the emergence of organized and national sports, issues of gender and race in the sporting world, and the intersection of U.S. sport with events such as the Civil Rights Movement and the Cold War.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 350 - U.S. Women's History

Credits: 3 (NR)
History of women and their changing status and gender roles in American society from colonial period through "second wave" of feminism in 1970s. Explores images and lives of women of different class, ethnic, and regional origins. Also focuses on women's political, economic, and legal conditions, and changes in them.

Prerequisite(s): 45 credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 351 - History of the Old South

Credits: 3 (NR)
History of South to outbreak of Civil War, with particular emphasis on rise of sectionalism. Focuses on development of distinct Southern culture through emergence of economic, political, social, agricultural, and intellectual institutions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 352 - The South since 1865

Credits: 3 (NR)
History of South during Reconstruction, Redeemer era, and New South, with particular emphasis on race relations. Covers political, economic, cultural, and intellectual development from aftermath of war.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 353 - History of Traditional China
China from earliest times to period of modern Western intrusion. Development of traditional Chinese culture, society, and government.

**Prerequisite(s):** 6 credits of history or permission of instructor.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HIST 354 - Modern China**

Credits: 3 (NR)  
China from 1644 to the People's Republic of China. Emphasizes coming of West and various stages of Chinese reaction.

**Prerequisite(s):** 6 credits of history or permission of instructor

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HIST 356 - Modern Japan**

Credits: 3 (NR)  
Japan from Meiji Restoration to World War II. Emphasizes Japan's modernization in face of challenge.

Fulfills general education requirement in global understanding.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HIST 357 - Postwar Japan**

Credits: 3 (NR)  
History of Japan from World War II to present. Examines Japanese experience of several key moments: Japan's defeat in Pacific War, reconstruction during U.S. occupation, rise to economic prominence during 1960s and 1970s, and cultural and international identity crisis during 1980s and 1990s.

**Prerequisite(s):** 45 credits or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
HIST 358 - Post-1949 China

Credits: 3 (NR)
Puts People's Republic of CHINA (PRC) into historical context by assessing legacies of China's socialist revolution (1949-1976) and post-socialist reforms (1978-present). Explores revolutionary heritage of the Chinese Communist Party, goals and agendas of china's socialist state, ideologies and policies shaping urban and rural development, individual agency and responses to revolutionary mass mobilization and market reforms.

Fulfills general education requirement in global understanding.

Prerequisite(s): 6 credits of history or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 360 - History of South Africa

Credits: 3 (NR)
Explores the historical processes that led to the rise of African kingdoms, colonialism, industrialization, resistance movements, and legalized segregation.

Fulfills general education requirement in global understanding.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

HIST 364 - Revolution and Radical Politics in Latin America

Credits: 3 (NR)
During 20th century, Latin America has witnessed both peaceful political movements and violent revolutions aimed at achieving social justice. Considers several of these movements in comparative perspective: Mexican Revolution, Arbenz government in Guatemala, Allende regime in Chile, Cuban and Nicaraguan revolutions, and Brazilian Worker's Party.

Fulfills general education requirement in global understanding.

Prerequisite(s): 6 credits of history or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 365 - Conquest and Colonization in Latin America
Credits: 3 (NR)
Examines forms of conquest and colonization practiced by Aztec, Inca, Spanish, and Portuguese in what is now Latin America. Includes role of ideology and religion in imperial rule, use of warfare to create empires and colonies, and implementation of political and economic systems to rule subject people.

Fulfills general education requirement in global understanding.

Prerequisite(s): 45 credits or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 366 - Comparative Slavery

Credits: 3 (NR)
Examines systems of slavery from ancient world to modern world, with special emphasis on Atlantic slave trade and slave societies in Latin America and Anglo America. Considers impact of slaves and slavery on cultural, economic, and political systems in Africa and Americas from 16th to 19th centuries.

Prerequisite(s): 45 credits or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 367 - History, Fiction, and Film in Latin America

Credits: 3 (NR)
Explores modern Latin American history through different types of texts: scholarly histories, historical novels, fictional films, documentary films, and oral history. Explores ways these texts produce knowledge about the past. What motivates different approaches? What counts as evidence? How do we know what really happened? How do we decide what mattered and what did not? Also introduces several important episodes in 20th century Latin American history.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 370 - War and American Society

Credits: 3 (NR)
Examines war and American society from the colonial period to the post-Cold War era, including how military institutions, war, and the preparation for war have affected American society, and how Americans have thought about military service, experience war, and made peace through their history. Special emphasis on civil-military relations and the role of war and militarism in
American culture.

**HIST 373 - The Civil War and Reconstruction**

Credits: 3 (NR)
Analyzes the history of the American Civil War from its origins in the late 18th century to the withdrawal of federal troops from the south in 1877. Examines the political, social, and economic issues that led to war; the home fronts, war leadership, diplomacy, combat motivation, and grand strategy; problems associated with reconstituting the nation's political institutions; and the integration of millions of newly freed slaves.

**HIST 377 - The Vietnam War**

Credits: 3 (NR)
Covers the causes, major events, and legacies of America's Vietnam War, including an introduction to Vietnamese history and culture, American decisions for war, strategy and major military engagements, diplomacy and peace talks, and the aftermath of the conflict in Vietnam and United States.

**HIST 386 - Topics in History**

Credits: 3-6 (RT)
Study of historical topics of special interest.

**Notes:** Topics announced in advance. May be repeated for credit when topic is different.

**HIST 387 - Topics in Global History**

Credits: 3 (RT)
Study of historical topics or periods of special interest in global, Latin American, African, Asian, or Middle Eastern history.

Fulfills general education requirement in global understanding.

**Notes:** Topics announced in advance. May be repeated for credit when topic is different. Fulfills the college requirement in non-
Western culture.

**HIST 388 - Topics in European History**

Credits: 3 (RT)
Study of historical topics or periods of special interest.

**Notes:** Topics announced in advance. May be repeated for credit when topic is different.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 389 - Topics in U.S. History**

Credits: 3 (RT)
Study of historical topics or periods of special interest.

**Notes:** Topics announced in advance. May be repeated for credit when topic is different.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 390 - The Digital Past**

Credits: 3 (NR)
Teaches the fundamentals of information technology within the context of a history course. Students learn fundamentals and skills as well as how our society became so enamored of and dependent on these knowledge and information tools. Understanding a new technology requires understanding how new technologies transform the societies that embrace them. Emphasizes the use of free and open-source software whenever possible.

Fulfills general education requirement in information technology (all).

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 391 - History of Virginia to 1800**

Credits: 3 (NR)
Discovery and settlement of Virginia. Colonial period with emphasis on development of representative government and race relations, Golden Age of Virginia dynasty, and coming of Civil War.
HIST 392 - History of Virginia Since 1800

Credits: 3 (NR)
Decision to secede, Civil War and Reconstruction, Readjustors and Populism, disfranchisement and Constitution of 1902, and rise of Senator Harry F. Byrd. Recent developments.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 393 - Topics in Film and History

Credits: 3 (RT)
Study of historical periods or topics from perspective of feature films and documentaries.

Notes: Topics available in advance from the department. May be repeated for a maximum of 6 credits when topic is different. A maximum of 6 credits may be applied to the BA in history.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 398 - Historical Study Abroad

Credits: 1-6 (RD)
Intended for participation in formally organized course offered by Center for Global Education during intersession or spring break.

Notes: May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

HIST 399 - Internship

Credits: 1-9 (RD)
Approved work-study programs in cooperation with specific organizations including area museums; archives; historic sites; and local, state, and federal agencies.

Prerequisite(s): History majors with permission of undergraduate director.

Notes: Credit determined by department. May be repeated for a maximum of 9 credits.
HIST 401 - Colonial America

Credits: 3 (NR)
Intensive study of colonial American history from European origins through Revolutionary War.

HIST 403 - Revolutionary Era in American History, 1763-1812

Credits: 3 (NR)
Study of formative years of new republic from Treaty of Paris of 1783 to election of 1820.

HIST 404 - Jacksonian America, 1812-1854

Credits: 3 (NR)
Study of age of Andrew Jackson. Emphasizes democratic institutions that emerged as dominant influences in American society.

HIST 426 - The Russian Revolution

Credits: 3 (NR)
Era of revolutionary activity from 19th century to end of 1920s, with emphasis on Russian Revolutions of 1917. Explores why revolutionary situation developed; political, social, and cultural issues at stake; why it took various forms; and revolution's contribution to nature of Soviet state and post-Soviet problems.

Prerequisite(s): 45 credits or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

HIST 431 - Medieval Intellectual Topics
Credits: 3 (NR)
Selected topics in intellectual history of Middle Ages. Topics vary, depending on discipline of instructor.

Equivalent to ENGH 421/FRLN 431, ENGL 431 (2010-2011 Catalog)

Notes: May be taken for credit by English or history majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 435 - Society and Culture in Early Modern Europe

Credits: 3 (NR)
Examines social and cultural lives of Europeans from end of Middle Ages to Industrial Revolution. Emphasizes popular and elite culture, as well as bridges and interrelationships between them. Focuses on religious, artistic, literary, and recreational behavior. Covers political activity and riots, strikes, royal receptions, and rituals.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 436 - European Society and Culture: 19th and 20th Centuries

Credits: 3 (NR)
Examines major cultural trends in Europe since French Revolution. Major themes include romanticism; socialism; Marxism; and social effect of modernization, science, and societies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 455 - History of Print Journalism

Credits: 3 (NR)
Development of print journalism from inception to present, with emphasis on interaction of technology, audience, and government intervention. Topics include birth of press; development of modern newspaper and American development, including Revolutionary and Civil wars; rise of independent press; and yellow journalism.

Equivalent to COMM 455

Prerequisite(s): 3 credits in COMM or HIST courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 460 - Modern Iran
Modern Iran, from 1800 to present, in context of several broad themes: institutional structure of state; role of great powers in Iran and Iranian response to economic, military, technological, and ideological challenge posed by West; interaction of religion and other ideologies and politics; economic development and impact on politics and society; and ways historians have sought to understand and interpret modern Iranian history.

Fulfills general education requirement in global understanding.

**Prerequisite(s):** 45 credits or permission of instructor.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 461 - Arab-Israeli Conflict**

Credits: 3 (NR)
Overview of history of Arab-Israeli conflict. Examines conflict from various perspectives: over land and between competing nationalisms and identities; in terms of national interests of various states, including Israelis and Palestinians as well as other Arab governments and great powers; and in terms of peace making and conflict resolution. Some knowledge of history of Middle East since World War I strongly advised.

**Prerequisite(s):** 45 credits or permission of instructor.

**Notes:** Fulfills the college requirement in non-Western culture.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 462 - Women in Islamic Society**

Credits: 3 (NR)
Surveys history of women in Islamic society from rise of Islam to present day. Examines historical processes that affected role and status of women in society, and specific topics around which issues of gender status and identity coalesced, especially in modern period.

Fulfills general education requirement in global understanding.

**Prerequisite(s):** 6 credits of history or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 465 - The Middle East in the 20th Century**
Political, social, and cultural history of Middle East since World War I. Emergence of Israel, Arab nationalism, and political and economic influence of Middle East in world affairs.

Prerequisite(s): 6 credits of history or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 466 - Origins of Conflict in Southern Africa

Credits: 3 (NR)
Explores historical origins of conflict in South Africa, focusing on themes of economic change, cultural interaction, and political consolidation during past five centuries.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 480 - Alexander the Great

Credits: 3 (NR)
Rise of Persia, Persian wars with Greece, subjugation of Greece by Philip II of Macedonia, and Alexander the Great and his conquest of Persian empire.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 490 - Honors Directed Readings, Honors Directed Research

Credits: 3 (NR)
Students must have completed at least one course in the field, or with the professor, chosen for these honors courses.

Prerequisite(s): Admission to history honors program and permission of instructor

Notes: The 3 reading credits should be taken before 3 research credits, though they may be taken concurrently. Either may be taken concurrently with HIST 499. Linked, individualized courses, usually given by same instructor. Involves directed readings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 491 - Honors Directed Readings, Honors Directed Research
Credits: 3 (NR)
Students must have completed at least one course in the field, or with the professor, chosen for these honors courses.

Prerequisite(s): Admission to history honors program and permission of instructor

Notes: The 3 reading credits should be taken before 3 research credits, though they may be taken concurrently. Either may be taken concurrently with HIST 499. Linked, individualized courses, usually given by same instructor. Culminates in research paper related to subject of readings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 498 - Directed Readings/Research in History

Credits: 1-3 (RT)
Readings, research conducted on individual basis in consultation with instructor.

Prerequisite(s): History majors with 90 credits and permission of instructor.

Notes: May be repeated for a maximum of 6 credits. Only 3 credits may be applied to credits for degree.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

HIST 499 - Senior Seminar in History

Credits: 3 (NR)
Research on specialized historical topic culminating in seminar paper and oral presentation. Synthesis course; students expected to integrate knowledge and skills acquired in general education courses.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

Prerequisite(s): History majors with 90 credits, ENGL 302/ENGH 302, HIST 300, and completion or concurrent enrollment in all university general education courses.

Notes: Subject determined by instructor. Student may present no more than 3 credits for graduation credit. Must receive passing grade to graduate with BA in history.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

HIST 510 - Approaches to Modern World History
Introduces historical study of world beyond Europe and United States. Students read major theoretical works and case studies of particular regions. Examines imperialism, national identity, and various forms of popular resistance; familiarizes students with range of scholarly approaches, including world systems theory and subaltern studies.

Prerequisite(s): Admission to graduate program in history.

**HIST 523 - Issues in American History**

Credits: 1-3 (RT)
Reading, analysis of selected problems.

Notes: Open to advanced undergraduates and graduates. Topic determined by instructor. May be repeated for credit when content differs.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

**HIST 524 - Issues in European History**

Credits: 3 (RT)
Reading, analysis of selected problems.

Notes: Open to advanced undergraduates and graduates. Topic determined by instructor. May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 525 - Problems in Latin American History**

Credits: 3 (RT)
Analysis of selected problems. Emphasizes reading and discussion of historical interpretations, and development of bibliography.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 535 - Problems in Comparative World History**
Investigates selected problems in global and comparative history, covering multiple countries or world regions.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 555 - Problems in Asian History**

Credits: 3 (RT)
Discussion of readings and historical interpretations and compilation of a comprehensive bibliography on given theme.

Notes: Topics announced by instructor. May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 565 - Problems in African History**

Credits: 3 (RT)
Analysis of selected problems in African history. Emphasis on reading and discussion of historical interpretations and development of bibliography.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 575 - Critical Issues and Debates in Islamic and Middle East Studies**

Credits: 3 (NR)
Introduces students to the central issues and debates surrounding the study of the Middle East, Islam, and Muslim societies. Covers key methodological issues including the role of area studies vis-à-vis disciplinary approaches and debates on the politics of knowledge production and historiography.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 585 - Problems in Middle Eastern History**

Credits: 3 (RT)
Analyzes selected problem. Emphasizes reading and discussion of historical interpretations, and development of bibliography.
HIST 598 - Historical Study Abroad

Credits: 1-3 (RT)
Intended for participation in formally organized course offered by the Center for Global Education.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0

HIST 601 - Themes in U.S. History I

Credits: 3 (NR)
Survey of U.S. History prior to 1877. Designed for individuals entering the graduate program who need to strengthen preparation in area, or who seek to enhance knowledge of latest interpretations in field. Stresses factual knowledge and its interpretation.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 602 - Themes in U.S. History II

Credits: 3 (NR)
Continuation of HIST 601.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 605 - Themes in European History I

Credits: 3 (NR)
Survey of European history from 1500 to 1815. Designed for individuals entering graduate program who need to strengthen preparation in this area, or who seek to enhance knowledge of latest interpretations in field. Stresses factual knowledge and its interpretation.

Prerequisite(s): Graduate standing.
HIST 606 - Themes in European History II

Credits: 3 (NR)
Survey of European history from 1815 to present. Designed for individuals entering graduate program who need to strengthen preparation in this area, or who seek to enhance knowledge of latest interpretations in field. Stresses factual knowledge and its interpretation.

Prerequisite(s): Graduate standing.

HIST 610 - The Study and Writing of History

Credits: 3 (NR)
Methodology of the historian including techniques of research, use of documentation and other sources, development of bibliography, and synthesis of material.

Prerequisite(s): Graduate standing.

HIST 613 - The Colonial Origins of American Society

Credits: 3 (NR)
Study of evolution of elements in colonial society that affect contemporary American institutions and patterns of behavior.

Prerequisite(s): Graduate standing.

HIST 615 - Problems in American History

Credits: 1-6 (RT)
Readings and discussion of bibliographies, interpretations, and research trends in topics selected by instructor.

Prerequisite(s): Graduate standing.
**Notes:** May be repeated for credit when topic is different.

**Hours of Lecture or Seminar per week:** 1-6
**Hours of Lab or Studio per week:** 0

**HIST 616 - U.S. Westward Movement**

Credits: 3 (NR)
Investigates continuity and change in American West. Topics include economic development, ethnicity, rural and urban life, and role of federal government.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 617 - Topics in the American Civil War Era**

Credits: 3 (NR)
Joint project of instructor and students into various aspects of common topic in Civil War era, with emphasis on historiography and historical method.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 618 - The Age of Jackson, 1815-1854**

Credits: 3 (NR)
Survey of social, cultural, intellectual, economic, and political changes in United States during period of rapid growth and expansion. Topics include second-party system; growth of sectionalism, nationalism, and expansionism; industrialization and spread of market economy; rise of romantic reform and evangelical religion; and growth of abolitionist and proslavery movements.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 619 - The Constitution, Civil Liberties, and the Supreme Court**

Credits: 3 (NR)
Investigates evolution of civil liberties in American history, and interaction of three branches of government in applying various
constitutionsal guarantees. Students read extensively in Supreme Court decisions and secondary literature, and undertake independent research.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 620 - Development of the Early Republic, 1783-1815

Credits: 3 (NR)
Investigates breakdown of Confederation, Constitutional Convention, and role of revolutionary ideology of republicanism. Discusses leadership and policies of republic in hostile international context. Students read extensively in monographic literature and prepare research paper.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 621 - Virginia and the American Revolution

Credits: 3 (NR)
Detailed examination of Virginia society on eve of American Revolution, and role in events from 1750 to 1789. Combines lectures, discussion of major themes, ideas, and personalities.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 623 - Recent U.S. History, 1945 to Present

Credits: 3 (NR)
Selected political, social, economic, diplomatic, and cultural forces that shaped the post-World War II American experience.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 624 - U.S. Diplomatic History
Credits: 3 (NR)
Study of selected issues in American foreign relations and changing historical interpretations of American diplomacy.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 626 - Approaches to American Culture**

Credits: 3 (NR)
Focuses on various approaches historians have taken to history of American culture: questions they asked, assumptions they made, disciplinary tools they used, and types of materials they analyzed. Concentrates on patterns of culture, and what they say about American past and present.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 628 - Immigration and Ethnicity in the United States**

Credits: 3 (NR)
Examines immigration and ethnicity in America since 1840. Considers why immigrants came, from where, under what circumstances, and how they adapted. Examines immigration policy and American attitudes toward immigration and ethnicity.

Prerequisite(s): Graduate standing.

Notes: Conducted as readings colloquium.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 629 - The Gilded Age and Progressive Era**

Credits: 3 (NR)
Examines history of United States from 1877 to 1918, with attention to history of reform movements and politics, and social history of the period. Familiarizes with major issues and historical literature of the period.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HIST 630 - U.S. Women's History**
Wide-ranging survey of burgeoning field of women's history, emphasizing critical evaluation of sources and interpretation. Readings represent variety of approaches, which may include material culture studies, medical history, history of sexuality, political history, and social and cultural history.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 631 - Era of the American Revolution**

Credits: 3 (NR)  
Examines history and historiography of revolutionary era, with special emphasis on social and ideological interpretations of period. Includes events leading to War for Independence, war itself, and social and political effects of war on American society.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 633 - Reconstruction**

Credits: 3 (NR)  
Examines panoply of political, social, economic, and constitutional concerns from 1863 to 1880, as North and South struggled over outcome of Civil War. Addresses political institutions and power in postwar North and South, and place of former slaves in society, politics, and economy.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 634 - Interwar America: 1918-1939**

Credits: 3 (NR)  
Considers issues of United States between the two world wars. Explores various ways issues complemented and contradicted each other in rich and complex historical era.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**HIST 635 - Problems in European History**
Credits: 3 (RT)
Investigates selected problems. Readings, discussions, development of bibliographies. Primary sources used where possible.

**Prerequisite(s):** Graduate standing.

**Notes:** May be repeated for credit when topic is different.

**Hours of Lecture or Seminar per week:** 1-6
**Hours of Lab or Studio per week:** 0

**HIST 636 - Political Culture in Twentieth-Century Germany and Austria: Continuities and Discontinuities**

Credits: 3 (NR)
Recent interpretations of key political events of 20th century. Asks if there were fundamental continuities in structure of German and Austrian society that can be observed throughout the period under review.

**Prerequisite(s):** Baccalaureate degree in history or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 637 - Great Britain: Empire to Commonwealth, 1870-1970**

Credits: 3 (NR)
Examines rise of "new imperialism" in Great Britain from 1870 to end of empire, and gradual formation of Commonwealth of Nations.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**HIST 638 - Western Europe in the Post-War Period**

Credits: 3 (NR)
Examines process of reconstruction, reconciliation, and integration in Western Europe in 20 years after World War II.

**Prerequisite(s):** Graduate standing.

**Notes:** Conducted as readings colloquium.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
HIST 639 - Society and Politics in Western Europe, 1750-1914

Credits: 3 (NR)
Focuses on changes in social conditions and ramifications in political life. Attention to urbanization of workers, changes in peasantry, growth of middle classes, decline of nobility, and major political developments and expansion of liberal reforms.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 640 - Metropolitan Cities of Europe in the Nineteenth and Twentieth Centuries

Credits: 3 (NR)
Studies individual cities, and investigates particular cities in depth. Considers economic, social, cultural, and political features of urban life.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 642 - Humanism and the Renaissance

Credits: 3 (NR)
The Renaissance as a unique period in European cultural history from ca. 1350 to 1520. Concentrates on Italian situation as standard, with consideration given to manifestations of Renaissance in northern Europe, especially Germany, until Reformation. Focuses on recent studies of political, social, intellectual, and religious changes. Students write class reports and a larger bibliographic paper.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 643 - Religion and Society in the Reformation Era

Credits: 3 (NR)
The Reformation, ca. 1500 to 1650, was a time of major religious, intellectual, social, and political upheaval in European history. Investigates reasons for changes, and effects on European society. First half focuses on Germany, but major events throughout Europe are studied.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**HIST 644 - Society and Culture in Early Modern Europe**

Credits: 3 (NR)
Overview of most recent historical work on social and cultural history of premodern West, ca. 1400 to 1800. Uses theoretical approaches and empirical methodologies of other disciplines, especially social anthropology, sociology, and literary theory, to shed new light on popular culture, class, manners, taste, rituals, religion, language, gender, and the state. Formulates new topics of research and poses new questions, and suggests new approach to more traditional topics such as politics, religion, and ideas.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**HIST 645 - The Russian Revolution and the Origins of the Soviet State**

Credits: 3 (NR)
Period between 1890 and 1924 with concentration on sources of Bolshevism, problems of old regime as they led to revolutions of 1905 and 1917, and establishment of new regime and its survival in environment of foreign and civil war.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**HIST 670 - Introduction to Behavioral History**

Credits: 3 (NR)
Analyzes and investigates the historical origins and development of contemporary behaviors and values, with particular emphasis on how these behaviors and values, as well as our perceptions of them, have changed over time and place.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**HIST 675 - Problems in Military History**

Credits: 3 (RD)
Readings and discussion of bibliographies, interpretations, and research trends in military history topics selected by the instructor.

Prerequisite(s): Graduate standing or permission of instructor.

Notes: May be repeated once when topic is different.
**HIST 677 - The Vietnam War**

Credits: 3 (NR)
Considers the causes, major events, and historiographic debates of America’s Vietnam War including the war’s antecedents in Vietnamese history, American decisions for war, strategy and major military engagements, the American antiwar movement, and diplomacy and peace talks.

Prerequisite(s): Graduate standing or permission of instructor.

**HIST 679 - War and Remembrance**

Credits: 3 (NR)
Considers various approaches to the study of public or collective memory as it pertains to war, in particular how people around the world have constructed memories of war and how those memories have been expressed in literature, popular culture, memorials, and commemorative activities.

Prerequisite(s): Graduate standing or permission of instructor.

**HIST 689 - Teaching and Learning History in the Digital Age**

Credits: 3 (NR)
Examines what happens when instructors integrate new media technology into history classroom. Includes consideration of learning theory, new media theory, and an in-depth examination of state-of-the-art in practice. In the final third of semester, students produce practicum that is either working history teaching web site or concept paper for site, depending on student's degree of technical sophistication. No prior facility with information technology required. Course appropriate for graduate students working as teachers or planning career in teaching.

Prerequisite(s): Graduate standing.

**HIST 690 - The Administration of Archives and Manuscripts**
Credits: 3 (NR)
Introduces principles and practices of managing records and administering archival and manuscript collections, public and private. Designed for graduate students with special interest in historical sources as well as for those specializing in applied history.

Prerequisite(s): 6 credits of U.S. history, or permission of department. Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 691 - Museum Studies

Credits: 3 (NR)
General introduction to museums of history and museum studies in the United States, intended for interested citizen as well as for assistance to students in course and career choices. Explores development, present state, and future possibilities of U.S. Museums, with some reference to international developments.

Prerequisite(s): 6 credits of U.S. history or permission of department. Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 692 - Historical Editing

Credits: 3 (NR)
Introduces fundamentals of historical editing of documents, including microform, word processing, and computer techniques. Designed for those seeking introduction to various areas of applied history, and those intending to edit historical documents for publication.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 693 - Historic Preservation

Credits: 3 (NR)
General introduction to historic preservation in the United States, intended for interested citizen and to assist students in course and career choices. Explores development, present state, and future possibilities of historic preservation in the United States, with some reference to international aspects of preservation.

Prerequisite(s): Graduate standing and 6 credits of U.S. history or permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
HIST 695 - History Symposium

Credits: 1-3 (NR)
Subject of academic and community interest pursued through discussions and lectures by distinguished guest instructors.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 696 - Clio Wired: An Introduction to History and New Media

Credits: 3 (NR)
Students with limited computer competency should consult department before enrolling. Introduces changes that new media and technologies are bringing to how we research, write, present, and teach about the past. Students explore theoretical and historical issues as well as learn hands-on skills in digital history.

Prerequisite(s): Graduate standing.

Notes: Students with limited computer competency should consult with department before enrolling.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 697 - Creating History in New Media

Credits: 3 (NR)
Seminar; students create original historical projects in digital media.

Prerequisite(s): HIST 696 or permission of instructor. Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 698 - Advanced Topics in History and New Media

Credits: 3 (NR)
Advanced topics in history and new media not covered in HIST 696, 697. Covers a range of topics at the frontiers of using new media to enable and enhance historical practice and research and will involve in-depth analysis of theoretical frameworks and pragmatic concerns related to the use of specific digital technologies.

Prerequisite(s): HIST 696, 697, or literacy in new media.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
HIST 711 - Research Seminar in U.S. History

Credits: 3 (RT)
Research in specialized topics using primary sources.

Prerequisite(s): Admission to MA in history, PhD in cultural studies, or a degree in the Higher Education Program and HIST 610 or permission of department.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 731 - Research Seminar in European History

Credits: 3 (RT)
Research in specialized topics using primary sources.

Prerequisite(s): Admission to MA in history, PhD in cultural studies, or a degree in the Higher Education Program and HIST 610 or permission of department.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 751 - Research Seminar in Comparative World History

Credits: 3 (NR)
Research seminar requiring comparative research and analysis. Organized around significant topic or theme in field of world history.

Prerequisite(s): HIST 610 or permission of department.

Notes: Topics vary from year to year. Maximum 6 credits may be earned.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 790 - Comprehensive Readings in U.S. History

Credits: 3 (NR)
Integrates past work in major field and fills gaps before comprehensive exam. After a review of graduate experience, student and instructor design reading list to round out preparation for exam.

Notes: To be taken in final semester of program.
HIST 791 - Comprehensive Readings in Comparative World History

Credits: 3 (NR)
Integrates past work in major field and fills gaps before comprehensive exam. After a review of graduate course work, student and instructor design reading list to round out preparation for exam.

Notes: To be taken in final semester of program.

HIST 792 - Comprehensive Readings in European History Since 1500

Credits: 3 (NR)
Integrates past work in major field and fills gaps before comprehensive exam. After review of graduate experience, student and instructor design reading list to round out preparation for exam.

Notes: To be taken in final semester of program.

HIST 794 - Internship in Applied History

Credits: 3-6 (RD)
All internship placements must be approved by the department to ensure suitability to student's program. Introduces applied history through work and study at historical museum, site, library archive, editing project, or other approved agency.

Prerequisite(s): Admission to graduate program in history and 3 hours of applied history.

Notes: May be repeated for a maximum of 6 credits.

HIST 796 - Directed Readings

Credits: 1-6 (RD)
Independent reading on topic agreed to by student and faculty member.
Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

HIST 798 - Directed Research and Writing in History

Credits: 3 (NR)
Intended for students in department's predoctoral track who are not writing master's thesis. Goal is to produce substantial and original contribution to historical knowledge on model of article in scholarly journal.

Prerequisite(s): Admission to MA program, HIST 610, and research seminar.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

HIST 799 - Thesis

Credits: 1-6 (RD)
Master's thesis research and writing under direction of faculty committee.

Notes: May not be taken prior to successful completion of comprehensive exam.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: S/NC

HIST 801 - New Developments in History

Credits: 3 (NR)
Survey of current developments in historical analysis and methodology.

Prerequisite(s): Admission to doctoral program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 802 - Readings for Doctor of Arts in Community College Education

Credits: 1-6 (RT)
Intensive reading of recent scholarship in broad areas of historical study. With advisor, students develop readings list and define at least three areas in which to prepare readings courses.
Prerequisite(s): Admission to doctor of arts in community college education program to study history.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

HIST 803 - Doctoral Readings for Major Field

Credits: 3 (RT)
Independent readings for PhD students on topic agreed on by student and instructor, taken in preparation for completing major field exam. Should be broadly comprehensive of field, and cover major historical themes and historiographical debates.

Prerequisite(s): Admission to doctoral program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 804 - Doctoral Readings for Minor Field

Credits: 3 (RT)
Independent readings for PhD students on topic agreed on by student and instructor, taken in preparation for completing minor field statement. Designed to help student master literature of subfield that is subject of field statement.

Prerequisite(s): Doctoral standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HIST 810 - History Doctoral Colloquium

Credits: 1 (NR)
Introduces array of scholars and scholarship through discussions of innovative historical events, important theories, and significant methodological breakthroughs in history.

Prerequisite(s): Doctoral standing.

Notes: May be taken for credit 6 times.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: S/NC

HIST 811 - Doctoral Research Seminar
Students pursue research projects in their areas of specialization.

**Prerequisite(s):** Doctoral standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**HIST 998 - Doctoral Dissertation Proposal**

Credits: 1-6 (RD)  
Work on research proposal that forms basis for doctoral dissertation.

**Prerequisite(s):** Advancement to candidacy

**Notes:** May be taken for maximum 6 credits.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

**HIST 999 - Doctoral Dissertation Research**

Credits: 1-12 (RD)  
Doctoral dissertation research and writing under direction of student's dissertation committee.

**Prerequisite(s):** Completion of HIST 998.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

**Honors Program in General Education (HNRS)**

Offered by the College of Humanities and Social Sciences

Only students enrolled in the Honors Program are eligible to take HNRS courses. HNRS 110 must be taken in the first semester.

**HNRS 110 - Research Methods**

Credits: 4 (NR)  
Prepares students in humanities and social sciences research practices. Offers students the opportunity to learn about research practices in the natural sciences, mathematics, economics, management, and law. Students learn how to choose and focus a research question, find and analyze sources, organize evidence in an essay shaped by an original thesis, write clearly, and address an audience of scholars.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

**HNRS 122 - Reading the Arts**

Credits: 3 (NR)
Explores relationship of parts to whole in artworks, connections among different art forms, and links between art and its historical context.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HNRS 130 - Conceptions of Self**

Credits: 3 (NR)
Drawing from appropriate works in social sciences, arts, and humanities, examines different conceptions and definitions of the self from diverse cultures and historical contexts.

Prerequisite(s): HNRS 110. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HNRS 131 - Contemporary Society in Multiple Perspectives**

Credits: 3 (NR)
Explores methods and perspectives in social sciences and humanities to evaluate contributions of different disciplines to understanding significant social issues and their global ramifications and our responsibilities as citizens of the world.

Prerequisite(s): HNRS 110. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**HNRS 230 - Cross-Cultural Perspectives**

Credits: 3 (NR)
Enables students to broaden cultural horizons and understand human behavior by studying societies in depth and in comparison.

Prerequisite(s): HNRS 110. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
HNRS 240 - Reading the Past

Credits: 3 (NR)
Considers constructions of historical narratives by examining significant current topics such as revolution, race, empire, and religion over time. Considers how public narratives about history are constructed.

Prerequisite(s): HNRS 110. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HNRS 353 - Technology in the Contemporary World

Credits: 3 (NR)
Analyzes emergence and impact of specific technologies on contemporary cultures. Explores television, automobile, newspapers, Internet, and computer games from historical, scientific, political, economic, and global perspectives.

Prerequisite(s): Completion or concurrent enrollment in all other required HNRS courses. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

HNRS 490 - Undergraduate Apprenticeship

Credits: 1-3 (NR)
Independent work with a faculty mentor on an inquiry-based project involving research, the arts, design, or teaching and mentoring.

Prerequisite(s): 45 credits and acceptance into the Undergraduate Apprenticeship Program.

Notes: This course is open only to undergraduates who have been accepted to the Undergraduate Apprenticeship Program.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

Honors Program Sciences (HNRT)

HNRT 125 - A Liberal Arts Approach to Calculus
Assumes understanding of basic algebra and functions. Studies exponential models and develops mathematical concepts of limit and infinity including the topic of derivatives.

Equivalent to HNRS 125 (2010-2011 Catalog)

**HNRT 225 - Applied Calculus**

Credits: 3 (NR)
A second course in the theory and applications of calculus for nonSTEM students. Topics include exponential models in the life sciences and business, and may include improper integrals and infinite series, differential equations, or probabilities.

**HNRT 226 - Topics in Quantitative Analysis**

Credits: 3 (NR)
Studies selected topics of special interest to honors students with suitable preparation.

Equivalent to HNRS 226 (2010-2011 Catalog)

**Notes:** For students who have taken calculus in high school. HNRT 226 is an alternative to HNRT 125

**HNRT 227 - Scientific Thought and Processes I**

Credits: 4 (NR)
Explores and integrates principles of classical and modern science through study of such topics as cosmology, evolution, ecology, mechanics, relativity, and quantum physics.

Equivalent to HNRS 227 (2010-2011 Catalog)

**Notes:** Includes a weekly lab session.

When Offered: Fall, Spring
HNRT 228 - Scientific Thought and Processes II

Credits: 4 (NR)

Explores and integrates principles of classical and modern science through study of such topics as cosmology, evolution, ecology, mechanics, relativity, quantum physics, and the environment.

Designated a Green Leaf Course.

Equivalent to HNRS 228 (2010-2011 Catalog)

Prerequisite(s): HNRT 227

Notes: Includes a weekly lab session.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

Information Security and Assurance (ISA)

Offered by the Volgenau School of Engineering

ISA 522 - Information Security Essentials

Credits: 3 (NR)
Course covers basic concepts and techniques in applied information security. Begins introducing the student to basic concepts of security including confidentiality, integrity, availability, and current concerns of anonymity, privacy and safety of web-based transactions, forensics investigations etc. Also covers the main safeguards available in security such as authentication, authorizations, and network security, and shows how these techniques are applied to the concerns of business, health care, nursing, sociology and law.

Prerequisite(s): An introductory information systems class or permission of instructor.

Notes: This course does not count for MS programs in the Computer Science Department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ISA 562 - Information Security Theory and Practice

Credits: 3 (NR)
A technical introduction to the theory and practice of information security, which serves as the first security course for the MS-ISA degree, is required as a prerequisite for all subsequent ISA courses (at the 600 and 700 levels) and subsumes most topics covered by the CISSP examination. Also serves as an entry-level course available to non-ISA students, including MS-CS, MS-IS,
and MS-SWE students.

Prerequisite(s): INFS 501, 515, 519, and SWE 510, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ISA 563 - Fundamentals of Systems Programming

Credits: 3 (NR)
Introduces systems and network programming for UNIX and Windows using lectures and hands-on labs. Covers ANSI C programming, system libraries and APIs, forking and threads, interprocess communications, synchronization, Windows API, and code debugging.

Prerequisite(s): An intermediate programming language course or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ISA 564 - Security Laboratory

Credits: 3 (NR)
Provides hands-on experience in configuring and experimenting with commodity-networked systems and security software in a live laboratory environment, with the purpose of understanding real-world security threats. Takes both offensive and defensive approaches and exposes students to a variety of real-world attacks, including viruses, worms, rootkits, and botnets. Possible mitigation and defending mechanisms, such as firewalls and intrusion detection software, also covered.

Prerequisite(s): ISA 562.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ISA 640 - Programming Language Security

Credits: 3 (NR)
Describes language-based techniques to provide security for executing code. Topics include a discussion on the need for and the advantages of language-based security, security principles and properties, memory and type safety, encapsulation and access control, certifying compilers and their verification methods, security types and information flow, and applying programming language-inspired techniques to enforce security in the semantic-web based languages.

Prerequisite(s): CS 540 and ISA 562 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ISA 650 - Security Policy

Credits: 3 (NR)
Focuses on security policy and its management for information systems having national and international connectivity. Issues include legal, international, cultural, and local factors. Students are expected to participate regularly in presenting material, in discussion of recent security issues, and by writing short papers on major current issues.

Prerequisite(s): ISA 522 or ISA 562.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ISA 652 - Security Audit and Compliance Testing

Credits: 3 (NR)
Presents the fundamental concepts of the IT-security audit and control process that is being conducted in a plethora of environments, including government, the financial industry, and the healthcare industry. The goal of this course is to enable the students to structure and perform audits based on the specifications of Sarbanes-Oxley, HIPAA, and FISMA audit programs. Covers all the CISA certification requirements in depth. Students completing the course are encouraged to attempt the certification exam on their own.

Prerequisite(s): ISA 562 or ISA 522 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ISA 656 - Network Security

Credits: 3 (NR)
An in-depth introduction to the theory and practice of network security. It assumes basic knowledge of cryptography and its applications in modern network protocols. Studies firewalls architectures and virtual private networks and provides deep coverage of widely used network security protocols such as SSL, TLS, SSH, Kerberos, IPSec, IKE, and LDAP. It covers countermeasures to distributed denial of service attacks, security of routing protocols and the Domain Name System, e-mail security and spam countermeasures, wireless security, multicast security, and trust negotiation.

Prerequisite(s): ISA 562 and INFS 612 or CS 555.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ISA 673 - Operating Systems Security

Credits: 3 (NR)
Covers fundamentals and advanced topics in operating system (OS) security, including OS-level security mechanisms and policies in investigating and defending against real-world attacks on computer systems, such as self-propagating worms and large-scale botnets. Basic OS security techniques, such as logging, system call auditing, and memory protection, will be
Recent advanced techniques, such as honeypots and honeyfarms, system randomization, vulnerability fingerprinting, and virtualization, will also be introduced.

Prerequisite(s): CS 571 and ISA 562 or permission of instructor.

ISA 674 - Intrusion Detection

Credits: 3 (NR)
Studies methodologies, techniques, and tools for monitoring events in computer system or network, with the objective of preventing and detecting unwanted process activity and recovering from malicious behavior. Topics include types of threats, host-based and network-based information sources, vulnerability analysis, denial of service, deploying and managing intrusion detection systems, passive versus active responses, and designing recovery solutions.

Prerequisite(s): (ISA 563 or (CS 262 and CS 367)) AND ISA 656.

ISA 681 - Secure Software Design

Credits: 3 (NR)
Theory and practice of software security, focusing in particular on some common software security risks, including buffer overflows, race conditions and random number generation, and the identification of potential threats and vulnerabilities early in the design cycle. Emphasis is on methodologies and tools for identifying and eliminating security vulnerabilities, techniques to prove the absence of vulnerabilities, and ways to avoid security holes in new software and on essential guidelines for building secure software. Explores how to design software with security in mind from the ground up and integrate analysis and risk management throughout the software life cycle.

Equivalent to SWE 781

Prerequisite(s): SWE 619 or permission of instructor.

ISA 685 - Emerging Topics in Cyber Security

Credits: 3 (NR)
This seminar course provides a student team-based learning experience based on topics selected by leading experts in the area of applications of Information Security Concepts in the real-world scenarios. The (five to six) invited lecturers will lead a discussion followed by two days of project work after each lecture. Teams of students will be assigned to discuss different applications of the concept of discussion. Students develop the critical skills of applying security concepts and analysis to real world scenarios.

Prerequisite(s): Graduate standing in IT&E.
Notes: This course is intended for students in the MS-AIT program. Students in the MS-CS, MS-ISA, MS-INFS and MS-SWE programs cannot use this course for their degree.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**ISA 697 - Topics in Information Security**

Credits: 1-6 (RT)
Special topics in information security and assurance not occurring in regular ISA sequence.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit when distinct offerings of course differ in subject.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ISA 763 - Security Protocol Analysis**

Credits: 3 (NR)
Teaches how to design, understand, verify, and test communication protocols so they meet their objectives of recognizing the basic components of a communication protocol; specifying security properties accurately; modeling actors and mal-actors against which a protocol ought to be secure; discussing verification and testing methods and their limitations by ensuring that the specified protocol satisfies stated security objectives in the presence of specified mal-actions; designing a medium-size protocol that satisfies a specification of requirement; using existing tools to specify and verify security protocols; and testing protocols for satisfying their security objectives.

Prerequisite(s): ISA 650 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ISA 764 - Security Experimentation**

Credits: 3 (NR)
Teaches how to conduct security experimentations and empirically demonstrate, validate, and evaluate security vulnerabilities, exploits, and defense mechanisms. By the end of the course, students will gain a deeper understanding and first-hand experience on capturing packets of interests from both wired and wireless networks, and replying interested network flows and how shellcode various buffer overflows attacks, worms, spyware, rootkits, botnets, anonymous communication and traceback mechanisms work.

Prerequisite(s): ISA 562, ISA 564, ISA 674, or permission of instructor.
ISA 765 - Database and Distributed Systems Security

Credits: 3 (NR)
Science and study of methods of data protection: discretionary and mandatory access controls, secure database design, data integrity, secure architectures, secure transaction processing, information flow controls, inference controls, and auditing. Covers security models for relational and object-oriented databases; security of databases in distributed environments; statistical database security; and survey of commercial systems and research prototypes.

Prerequisite(s): INFS 614 and ISA 562, or permission of instructor.

ISA 767 - Secure Electronic Commerce

Credits: 3 (NR)
Cryptography review, cryptographic protocols, secure electronic transactions, public key certificates and infrastructures, authentication and authorization certificates, secure credential services and role-based authorization, mobile code security, security of agent-based systems, electronic payment systems, intellectual property protection, secure time stamping and notarization.

Prerequisite(s): ISA 562 and 656, or permission of instructor.

ISA 785 - Research in Digital Forensics

Credits: 3 (NR)
Focuses on research-related aspects of digital forensics including open problems in digital forensics, countermeasures against digital forensics, and fundamental and practical limitations of current digital forensics techniques. Also covers currently established techniques and tools for digital forensics as well as common legal and ethical issues.

Prerequisite(s): ISA 562, CS 571 and CS 555 or permission of instructor.

ISA 796 - Directed Readings in Information Security

Credits: 3 (RD)
Research and analysis of contemporary problem in information security.

**Prerequisite(s):** Graduate standing in information security and assurance, with at least 12 prior credits in MS.

**Notes:** Prior approval required by faculty sponsor who supervises student's work. To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair. Written report also required. Maximum of 6 credits may be earned.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

**ISA 797 - Advanced Topics in Information Security**

Credits: 3 (RT)  
Special advanced topics not occurring in regular ISA sequence.

**Prerequisite(s):** Permission of instructor.

**Notes:** May be repeated for credit when distinct offerings of course differ in subject.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ISA 798 - Research Project**

Credits: 3 (RD)  
Research project chosen under guidance of full-time graduate faculty member, resulting in written technical report.

**Prerequisite(s):** 18 credits applicable toward MS.

**Notes:** Prior approval required by faculty sponsor who supervises student's work. To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

**ISA 799 - Thesis**

Credits: 1-6 (RD)  
Original or expository work chosen and completed under supervision of graduate faculty member, which results in technical
report accepted by three-member faculty committee. Report must be defended in oral presentation.

Prerequisite(s): 18 credits applicable toward MS or permission of instructor.

Notes: To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

ISA 862 - Models for Computer Security
Credits: 3 (RD)
This class will be focused on current research in Security with emphasis in Network and Software Security.

Prerequisite(s): ISA 562.

Notes: May be repeated with change in topic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

ISA 863 - Advanced Topics in Computer Security
Credits: 3 (RD)
Current topics of advanced research. Content varies depending on faculty interests, research developments, and student demand. Requires substantial student participation. May include formal models for computer security, multilevel data models, multilevel database management system architectures, secure concurrency control protocols, distributed secure system architectures, integrity models and mechanisms, security policy, and requirements analysis.

Prerequisite(s): IT 862 or 865, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

Information Systems (INFS)
Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.
INFS 310 - Program Structure and Design for Business Applications

Credits: 3 (NR)
Teaches structured programming and design using high-level language. Focuses on program design, coding, debugging, and documentation.

Equivalent to IT 308

Prerequisite(s): Computer programming course in high school or college.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 311 - Database Management

Credits: 3 (NR)
Studies logical and physical characteristics of data and their organization in computer processing. Emphasizes data as resource in computer applications; examines database management system (DBMS) software and its design, implementation, and use.

Equivalent to IT 314

Prerequisite(s): Computer programming course in high school or college.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 312 - Computer Architecture and Operating Systems

Credits: 3 (NR)
Introduces computing system hardware components, architecture, organization, and operating system software concepts. Provides basic experience in assembly language programming for modern microprocessors, and examines techniques for system evaluation and selection.

Prerequisite(s): INFS 310 or CS 112.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 315 - High-Level Programming Languages

Credits: 3 (NR)
Studies structure and application of high-level languages by stressing design and implementation of data types, data structures, and algorithms. Includes computing lab. Credit does not count toward requirements for major in computer science.

Prerequisite(s): INFS 310 or CS 112.
INFS 316 - Software Systems Engineering

Credits: 3 (NR)
Studies programming environments, including software tools and control of software development for large information systems engineering projects.

Prerequisite(s): INFS 310 or CS 211.

INFS 414 - Advanced Database

Credits: 3 (NR)
Explores advanced concepts of database modeling using enterprise-level database management system. Topics include object-oriented database processing, data integrity, transactions, locks, concurrency control, backup, recovery, optimization, data mining, Internet databases, server programming, and security.

Equivalent to IT 414

Prerequisite(s): IT 314 or equivalent.

INFS 462 - Information Security Principles

Credits: 3 (NR)
Studies security policies, models, and mechanisms for secrecy, integrity, availability and usage controls. Topics include models and mechanisms for mandatory, discretionary and role-based access controls; authentication technologies; control and prevention of viruses and other rogue programs; common system vulnerabilities and countermeasures; privacy and security policies and risk analysis; intellectual property protection; and legal and social issues.

Equivalent to IT 462

Prerequisite(s): IT 212 or equivalent.

INFS 498 - Independent Study in Information Systems Engineering
Directed study of special topics of current interest in INFS.

**Prerequisite(s):** 60 credits; must be arranged with instructor and approved by department chair before registering.

**Notes:** May be repeated for maximum 6 credits if topics substantially different.

**Hours of Lecture or Seminar per week:** 1-12
**Hours of Lab or Studio per week:** 0

### INFS 501 - Discrete and Logical Structures for Information Systems

Credits: 3 (NR)
Study of discrete and logical structures for information systems analysis and design including basic set theory and proof techniques, propositional and predicate logic, trees and graphs, finite state machines, formal languages and their relation to automata, computability and computational complexity, formal semantics-operational, axiomatic and denotational approaches.

**Prerequisite(s):** 6 credits of undergraduate mathematics.

**Notes:** Credit cannot be applied to a graduate degree in the Volgenau School or the BS degree in computer science.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### INFS 515 - Computer Organization

Credits: 3 (NR)
Computer hardware architecture concepts including number systems, machine representation of numbers, instruction set formats, addressing techniques, memory organization, internal processor structure and operation. Symbolic assembly language fundamental operating systems concepts: process synchronization and scheduling, interprocess communication, memory management, virtual memory, deadlocks, file I/O and disk management, and LINUX operating system case studies.

**Prerequisite(s):** Undergraduate courses or equivalent knowledge in structured programming in a high-level language.

**Notes:** Credit cannot be applied to a graduate degree in the Volgenau School or the BS degree in computer science.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### INFS 519 - Program Design and Data Structures

Credits: 3 (NR)
Study of the fundamentals of data structures and algorithms applied in programming solutions to application problems. The course stresses programming in a modern high-level language. Laboratory required.
Prerequisite(s): Undergraduate courses or equivalent knowledge in structured programming in a high-level language.

Notes: Credit cannot be applied to a graduate degree in the Volgenau School or the BS degree in computer science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**INFS 524 - Database Management Essentials**

Credits: 3 (NR)
Relational database management systems. Covers logical and physical database design; query languages and database programming; and examines commercial systems.

Equivalent to AIT 524

Prerequisite(s): One programming course and six credits of college math.

Notes: Computing lab. This course does not count toward MS programs offered in the Computer Science Department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**INFS 565 - Database and Distributed System Security Principles**

Credits: 3 (NR)
Introduces information and distributed system security fundamentals. Topics include notions of security, threats and attacks; legal and ethical issues; security evaluation; data models, concepts, and mechanisms for database and distributed system security; inference in statistical databases; basic issues in operating system, application and network security.

Prerequisite(s): Permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**INFS 612 - Principles and Practices of Communication Networks**

Credits: 3 (NR)
Introduces principles of computer networks and applications to Internet. Discusses details of layering, protocols, performance, resource allocation, management, security and other contemporary issues related to networks. Examples of course material are protocols such as HTTP(S), DNS, TCP/IP, RSVP, SNMP, algorithms such as Dijkstra's link state routing; and security measures such as firewalls and encryption, the principles behind them and analysis of performance.

Prerequisite(s): INFS 501, 515, 519, and SWE 510, or equivalent

Notes: No substitutions can be made for this class.
INFS 614 - Database Management

Credits: 3 (NR)
Introduces database systems, emphasizing study of database models and languages and practice of database design and programming. Topics include Entity-Relationship model, relational model and its formal query languages, SQL, theory of relational database design, and object-oriented and logic-based databases.

Prerequisite(s): INFS 501, 515, 519, and SWE 510, or equivalent.

Notes: Requires computing lab. No substitutions can be made for this class.

INFS 622 - Information Systems Analysis and Design

Credits: 3 (NR)
Integration of computing technologies, systems analysis, system design practices, and management criteria in the design of large-scale information management and decision-support systems. Includes cases, computing lab.

Prerequisite(s): INFS 501, 515, and 519, or equivalent

INFS 623 - Web Search Engines and Recommender Systems

Credits: 3 (NR)
Study of Web search engines and recommender systems. Topics to include classical information retrieval methods, Boolean retrieval systems, ranked retrieval, performance metrics, Web crawling, link analysis, overall search engine architecture, fundamentals and classification of recommender systems, learning user interests and object properties, and case studies.

Prerequisite(s): INFS 501, 515, 519, and SWE 510.

INFS 640 - Introduction to Electronic Commerce

Credits: 3 (NR)
Studies electronic commerce from both managerial and technical perspectives. Topics include e-commerce models and concepts;
Internet and web protocols and infrastructure; e-commerce marketing and branding; security protocols and standards; e-commerce payment systems; and case studies of business-to-consumer, business-to-business, consumer-to-consumer, and e-government.

Prerequisite(s): INFS 501, 515, and 519; and SWE 510 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**INFS 650 - Development Frameworks for Information Systems Applications**

Credits: 3 (NR)
Principles and methods of building commercial applications within high-level framework. Tools for system construction are considered, along with variety of programming languages, component integration, and design methods. Applications investigated through program construction in varied settings, such as database systems, graphical user interfaces, and prototyping.

Prerequisite(s): INFS 501, 515, 519, and SWE 510 or equivalent.

Notes: Requires programming projects.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**INFS 697 - Topics in Information Systems**

Credits: 1-6 (RD)
Presents special topics in information systems not occurring in regular INFS sequence.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit when distinct offerings of course differ in subject.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**INFS 740 - Database Programming for the World Wide Web**

Credits: 3 (NR)
Information systems accessible through web and Internet are becoming prevalent. Course focuses on technologies and industry standards for accessing and manipulating persistent data that are suitable for web applications.

Prerequisite(s): INFS 614.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
INFS 750 - Application Frameworks for Windowed Information Systems

Credits: 3 (NR)
Studies use of object-oriented visual application frameworks in building event-driven windowed systems. Topics include windowed systems as event-driven systems; central architecture of windowed systems and encapsulation of windowed architectures by object-oriented frameworks; and analysis and design of windowed applications. Illustrates various features of visual application frameworks using variety of information systems applications. Programming projects.

Prerequisite(s): INFS 650.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 755 - Data Mining

Credits: 3 (NR)

Prerequisite(s): STAT 344 or equivalent undergraduate course in probability, INFS 614 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 760 - Advanced Database Management

Credits: 3 (NR)
Study of advanced database models and languages, database design theory, transaction processing, recovery, concurrency, distributed database, and security and integrity. Discusses recent developments and research directions.

Prerequisite(s): INFS 614.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 764 - Object-Oriented Database Systems

Credits: 3 (NR)
Studies concepts and systems of object-oriented (OO) databases. Topics include OO design, data models, query languages, new data types, and implementation. Also includes detailed case study and project performed on OO-DBMS. Surveys various prototypes, commercially available systems, and emerging standards.

Prerequisite(s): INFS 614 or CS 650, or permission of instructor.

Notes: Knowledge of object-oriented programming language such as C++ highly desirable.
INFS 770 - Knowledge Management for E-Business

Credits: 3 (NR)
Addresses knowledge management (KM) from managerial, technical viewpoints in context of large organizations doing business over web and Internet. Topics include KM life cycle for knowledge creation, aggregation, dissemination, and sharing; ontology modeling, design, and engineering; role of standards such as XML, RDF, web services, and semantic web for e-business; business rules and reasoning engines; and digital rights management for e-business.

Prerequisite(s): INFS 622 or permission of instructor.

INFS 772 - Intelligent Agents and the Semantic Web

Credits: 3 (NR)
Course covers the role of intelligent agents in cooperating to access, harvest, sift and winnow information and knowledge from the semantic web. Topics include agent architectures, practical reasoning and deductive agents, beliefs-desires-intentions (BDI) framework for agent reasoning, commitments and actions; Semantic Web ontology languages, description logics, reasoning and rule languages; and agent communication languages, protocols and standards.

Prerequisite(s): INFS 614

INFS 774 - Enterprise Architecture

Credits: 3 (NR)
This course presents the basic concepts and methodologies for the discipline known as Enterprise IT Architecting within a framework, structure, and methodology. Enterprise IT Architecting is a necessary step for designing and developing a system of information systems. It includes the definition of the business, work, functional, information and technical perspectives. As such, it is the enabling approach for the system development process that builds complex information systems.

Equivalent to IT 874

Prerequisite(s): INFS 622 or permission of instructor.
INFS 790 - Information Systems Policy and Administration

Credits: 3 (NR)
Capstone course integrating technical and executive policy issues of information systems. Examines critical executive issues through case studies and comprehensive individual project. No substitutions can be made for this class.

Prerequisite(s): Completion of all core courses.

Notes: Should be taken in final semester before graduation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 796 - Directed Readings in Information Technology

Credits: 3 (RT)
Research and analysis of contemporary problem in information system development.

Prerequisite(s): Graduate standing in information systems, with at least 12 prior credits in MS.

Notes: To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair. Prior approval required by faculty sponsor who supervises student's work. Written report required. Maximum 6 credits may be earned.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 797 - Advanced Topics in Information Systems

Credits: 1-6 (RD)
Special advanced topics not occurring in regular INFS sequence.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit when distinct offerings of course differ in subject.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 798 - Research Project

Credits: 3 (NR)
Research project chosen under guidance of full-time graduate faculty member, resulting in written technical report.

Prerequisite(s): 18 credits applicable toward MS.
Notes: To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair. Prior approval required by faculty sponsor who supervises student's work.

**INFS 799 - Thesis**

Credits: 1-6 (RD)
Original or compilary work evaluated by a committee of three faculty members.

Prerequisite(s): 18 credits applicable toward MS

Notes: To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair.

**INFS 861 - Distributed Database Management Systems**

Credits: 3 (NR)
Topics include transaction management, concurrency control, deadlocks, replicated database management, query processing reliability, and surveys of commercial systems and research prototypes.

Prerequisite(s): INFS 614 or equivalent.

**INFS 865 - Networks and Distributed Systems Security**

Credits: 3 (NR)
Detailed study of network and distributed systems security. Reviews basic cryptography and threats and vulnerabilities in distributed systems. Covers security services and confidentiality, authentication, integrity, access control, non-repudiation, and their integration in network protocols. Topics also include key management, cryptographic protocols and their analysis; access control, delegation, and revocation in distributed systems; and security architectures, multilevel systems, and security management and monitoring.

Prerequisite(s): INFS 612 or equivalent.
INFS 867 - Intelligent Databases

Credits: 3 (NR)
Studies models and techniques that empower database systems with intelligent and cooperative behavior, with emphasis on subjects such as knowledge-rich databases, logic databases, epistemological queries, intentional answering, and knowledge discovery. Topics include user interfaces, cooperative query interfaces, interactive query constructors, graphical interfaces, and browsers; uncertainty representing, manipulating, and retrieving uncertain, imprecise, or incomplete information; and formulating and interpreting vague or incomplete queries.

Prerequisite(s): INFS 760, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 870 - Organizational and Policy Aspect Informatics

Credits: 3 (NR)
Examines effects of informatics on national and international policy; setting of international policy on informatics; ethical and social change in governments and organization; shaping of national policy in informatics; industry growth; and research methods from various scientific disciplines.

Prerequisite(s): Doctoral status or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

INFS 950 - Design and Management Aspects of Information Systems

Credits: 3 (NR)
Impact of organizations and management of information systems (IS) and vice versa. Topics include problems of introducing IS; effect on organizational, economic, and political framework; participative design and new techniques for specification, analysis, design, and implementation of IS; rapid prototyping and expert systems; possible conflicts; methods in life-cycle management; and economic analysis.

Prerequisite(s): INFS 790 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Information Technology (IT)

Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.
IT 101 - Introduction to Information Technology

Credits: 3 (NR)
Introduces fundamental concepts underpinning state-of-the-art applications. Topics include quantitative and historical perspectives underlying major information technologies, theoretical background on wide range of information technologies as well as issues surrounding the social, economic, and political contexts in which IT exists. Provides exposure to cutting-edge technologies and trends including wireless multimedia, mobile communications, computer security, digital video and audio, and high-performance computing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 103 - Introduction to Computing

Credits: 3 (NR)
This course, using both lecture and laboratory practice, introduces students to basic computer concepts in hardware, software, networking, computer security, programming, database, e-commerce, decision support systems, and other emerging technologies such as blogs, wiki, RSS, podcasting, and Google applications. Additional lectures examine social, legal, ethical issues including privacy, intellectual property, health concerns, green computing, and accessibility. Students learn techniques to search, evaluate, validate, and cite information found online. Widely used applications including word processing, spreadsheets, databases, presentation, and web development software are studied

Fulfills general education requirement in information technology (all).

Prerequisite(s): Knowledge of high school algebra.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2

IT 106 - Introduction to IT Problem Solving Using Computer Programming

Credits: 3 (NR)
Introduces use of procedural programming as an IT resource for developing solutions to business problems. Emphasizes techniques & practices for design of solutions. Includes use of expressions, scalar data types, control structures as well as use of IDEs for development and debugging.

Prerequisite(s): IT 103 or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Fall, Spring

IT 108 - Programming Fundamentals

Credits: 3 (NR)
Introduces programming fundamentals and presents software development process. Students learn to write programs in high-
level, object-oriented language.

**Prerequisite(s):** IT 103 or permission of department. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 1

### IT 198 - Independ Study Informatn Tech

Credits: 1-3 (RD)  
**Prerequisite(s):** Permission of instructor. Individualized section form required.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

### IT 206 - Object Oriented Techniques for IT Problem Solving

Credits: 3 (NR)  
This course introduces the use of object-oriented programming as an IT tool for developing solutions to business problems. Emphasizes role and use of classes, methods, and exceptions in creating solutions. Introduces concepts of event-driven programming.

**Prerequisite(s):** IT 106 or permission of department. Prerequisite enforced by registration system.

**Notes:** Students cannot receive credit for both IT 108 and IT 206.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1  
**When Offered:** Fall, Spring

### IT 207 - Applied IT Programming

Credits: 3 (NR)  
Building on fundamentals of structured and object-oriented programming, this course covers client and server side scripting languages and an SQL database management system. Students will use open source software tools to develop database-enabled web applications.

**Prerequisite(s):** IT 103 and one of: IT 206, IT 108, or CS 112; or permission of department. Prerequisite enforced by registration system.

**Corequisite(s):** IT 214.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
IT 212 - Computer Hardware Fundamentals

Credits: 3 (NR)
This course explains the basic principles of how computers work. It provides a comprehensive understanding of the essential components associated with computers with a focus on PCs. Topics include history of computers, the microprocessor, motherboard, memory, graphics and sound adapters, input and output devices, and storage media. An overview of operating systems and other software, as well as the various methods used to connect computers to each other and the Internet, are presented. The course also addresses recent advances in computer architectures and computer hardware and how they affect computer performance. Presentations of actual hardware are included so that students can gain experience in identifying the various internal and external components of a PC.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 213 - Multimedia and Web Design

Credits: 3 (NR)
Through lecture, class demonstration, class discussion, and hands-on lab experience, introduces multimedia and web computer graphics. Focuses on development of web-enabled multimedia applications from practical business perspective. Introduces and discusses technological, aesthetic, and human factors.

Prerequisite(s): IT 103 or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

IT 214 - Database Fundamentals

Credits: 3 (NR)
Introduces relational database management systems and their applications. Students learn about types of databases, data modeling, designing relational databases, normalization and relationships, and recent trends in database management, including web applications. Students apply learned concepts using modern database application to create tables, queries, forms, and reports.

Prerequisite(s): IT 103 or permission of department. Prerequisite enforced by registration system.

Corequisite(s): IT 207.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 223 - Information Security Fundamentals

Credits: 3 (NR)
Introduces concept of information security. Discusses need for organizational policy to define required services such as confidentiality, authentication, integrity, nonrepudiation, access control, and availability, and mechanisms to implement those services. Covers different types of security including physical security, computer security, and network security; common threats
to and attacks against information systems, including accidental damage, identity theft, malicious software, and "spam"; and defensive measures

**Prerequisite(s):** IT 103 or equivalent; or permission of department. Prerequisite enforced by registration system.

**Notes:** Students cannot receive credit for both IT 221 and 223.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**IT 250 - Introductory Statistics I**

Credits: 3 (NR)  
**Prerequisite(s):** High school algebra.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**IT 293 - Applied IT: Junior Transition**

Credits: 1 (NR)  
Focuses on transition issues for sophomores and transfer students in Applied Information Technology programs. Assists sophomore and transfer students with choice of concentration, course selection, and career readiness.

**Prerequisite(s):** Sophomore standing

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

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**IT 300 - Modern Telecommunications**

Credits: 3 (NR)  
Comprehensive overview of the fundamental principles of telecommunications, including current status and future directions of the public switched telephone network, cellular networks, satellite networks, and computer networks.

**Prerequisite(s):** IT 101 or permission of department. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**IT 304 - IT in the Global Economy**
Explores how IT changed nature of society and contributed to evolution of global economy. Examines changing nature of work, education, and communication, and ethical issues such as intellectual property rights, computer-related crime, privacy concerns, and public policy issues.

Fulfills general education requirement in information technology (ethics only).

**Prerequisite(s):** IT 103 or equivalent; or permission of department. Prerequisite enforced by registration system.

**Notes:** Students cannot receive credit for both IT 304 and CS 306.

**IT 306 - Program Design and Data Structures**

Credits: 3 (NR)
Fundamentals of data structures and analysis of algorithms. Large programs written in a modern, high-level programming language. Stresses abstraction, modular design, code reuse, and correctness.

**Prerequisite(s):** IT 206, MATH 112; or permission of department. Prerequisite enforced by registration system.

**Notes:** Students cannot receive credit for both IT 208 and IT 306.

**IT 308 - Event-Driven Programming**

Credits: 3 (NR)
Building on the programming concepts covered in IT 108, this course focuses on graphical user interfaces. Students will design, develop, and document event-driven programs using an object-oriented language.

Equivalent to INFS 310

**Prerequisite(s):** IT 206; or permission of department. Prerequisite enforced by registration system.

**IT 314 - Database Management**

Credits: 3 (NR)
The course introduces students to the Oracle Developer application development utilities and tools and describes how to create and manipulate databases in Oracle database management system. The course provides an extensive overview of SQL and introduction to PL/SQL. Topics include data definition and manipulation languages, stored procedures, triggers, indexing
techniques, and elementary query optimization.

Equivalent to INFS 311

Prerequisite(s): IT 214, or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 315 - Mobile Development

Credits: 3 (NR)
Studies business-oriented applications for popular mobile platforms including Blackberry, Android and Apple. Provides overview of mobile platforms and devices including evaluation, uses, design and development of applications.

Prerequisite(s): IT 206 and IT 213. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

IT 322 - Modern Data Warehousing and Visualization

Credits: 3 (NR)
Basic concepts of data warehousing, mining, and visualization, emphasizing technical and management issues. Methodology and tools to design and implement data warehouses to provide reliable data that are integrated, structured and prepared for further querying, decision making, data mining and knowledge discovery. Analyzes use of enterprise-wide data store linking information from diverse sources making it accessible for various user purposes.

Prerequisite(s): IT 214 or equivalent, or permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

IT 331 - Web I: Web Development

Credits: 3 (NR)
Introduces the principles and techniques necessary for successful client-side web development. Topics such as XHTML, Cascading Style Sheets, JavaScript, DOM, XML, RSS, and AJAX are presented. Students will learn to develop attractive and interactive web pages and applications and use client-side web-scripting languages to solve problems both with a text editor and more powerful WYSIWYG HTML editor.

Prerequisite(s): IT 103, IT 207, and IT 213; or permission of department. Prerequisite enforced by registration system.

Corequisite(s): IT 207
IT 332 - Web Site Administration

Credits: 3 (NR)
Covers web server administration and web security, property sheets related to these sites and security features, hosting multiple web sites on same web server, associated performance issues, and application-level password security.

Prerequisite(s): IT 331 and IT 341; or permission of department. Prerequisite enforced by registration system.

IT 335 - Web Development using Content Management Systems

Credits: 3 (NR)
Through lectures and hands-on lab experience, presents web development techniques using content management systems (e.g. Joomla, Dot net nuke). Introduces characteristics of various types of websites (corporate portals, intranets and extranets; online magazines, newspapers, and publications; e-commerce and online reservations, government applications, small business websites). Presents methods, languages, tools related to web content management systems from an applied perspective.

Prerequisite(s): IT 207 and IT 213; or permission of department. Prerequisite enforced by registration system.

IT 341 - Data Communications and Network Principles

Credits: 3 (NR)
Focuses on the primary aspects of data communications networking, including a study of the Open Systems Interconnection (OSI) and Internet models. Students will start at Layer 1 with the study of various Layer 1 interface and cabling configurations. They will construct and test various cables with connectors. Moving up the OSI layers, students will focus on IP network addressing, network design, and enhanced hands-on router and port configurations. They will also learn security protocols and do static routing, EIGRP, RIPv2, and OSPF configurations. Students will also develop Access Control Lists (ACLs) used in modern day networks as a prime method of controlling network security and implement the ACLs on laboratory networks. Concentration on layers 4 through 7 include studying TCP, UDP, data reliability, and error correction methods, on the ladder to the FTP, HTTP, SMTP, DNS, and TFTP protocols of Layer 7.

Prerequisite(s): IT 101, IT 106, IT 212 and MATH 108; or permission of department. Prerequisite enforced by registration system.

Notes: This course is 50 percent lab work of configuration of routers and network design, implementation, and testing.
IT 342 - Operating Systems Fundamentals

Credits: 3 (NR)
Practices and procedures for installing and configuring modern operating systems, including user accounts, file, print, and terminal servers, mobile computing, and disaster recovery. Through practical lab sessions, students receive real-world experiences with multiple operating systems.

Prerequisite(s): IT 101, IT 206 or IT 108, and IT 212; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 343 - IT Resources Planning

Credits: 3 (NR)
Provides essential strategies and procedures for planning, organizing, staffing, monitoring, and controlling design, development, and production of system to meet stated IT-related need in effective and efficient manner. Fulfills writing-intensive requirement for BS in information technology.

Fulfills writing intensive requirement in the major.

Prerequisite(s): Junior standing in BS in information technology program, or permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 344 - Information Storage and Management Technologies

Credits: 3 (NR)
Provides an introduction to principles of information storage and management technologies. Covers Direct Attached Storage (DAS), networked storage models such as Network Attached Storage (NAS), Storage Area Network (SAN), and Content Addressed Storage (CAS); and applications in business continuity, replication, and disaster recovery. Includes exposure to real-world storage networking technologies.

Prerequisite(s): IT 341 and IT 342, or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

IT 348 - Cloud Computing

Credits: 3 (NR)
Cloud Computing gives students hands-on experience creating programs hosted on the Google cloud. The course teaches Python
and its use. Students create a small business application-style program using Python and App Engine-specific tools, following the Model-View-Controller-based paradigm, using HTML/Django I/O templates, with data storage on the Google Big Table.

Prerequisite(s): IT 207 or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

IT 353 - Information Defense Technologies

Credits: 3 (NR)
This course will examine and assess the role of information technology as a tool of warfare and civil defense. Topics will be discussed from both defensive and offensive perspectives and will include asset tracking, asymmetric warfare, network centric warfare, physical attacks, cyberterrorism, espionage, psyops, reconnaissance and surveillance, space assets, and applications of GPS and cryptographic technology. Students will research and write about the social, ethical, and political effects of such technology.

Prerequisite(s): IT 101 (or equivalent), IT 103 (or equivalent), and IT 223; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 357 - Computer Crime, Forensics, and Auditing

Credits: 3 (NR)
Covers computer crime, relevant laws, agencies, and standards. Presents auditing, logging, forensics, and related software. Explores legal principles such as chain of evidence, electronic document discovery, eavesdropping, and entrapment. Students get hands-on experience with forensics tools.

Equivalent to CRIM 304

Prerequisite(s): IT 103 and IT 223; or permission of department. Prerequisite enforced by registration system.

Notes: Students cannot receive credit for both IT 222 and 357.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 366 - Network Security I

Credits: 3 (NR)
Examines information security services and mechanisms in network context. Topics include symmetric and asymmetric cryptography; message authentication codes, hash functions and digital signatures; digital certificates and public key infrastructure; access control including hardware and biometrics; intrusion detection; and securing network-enabled applications including e-mail and web browsing.
Prerequisite(s): IT 206 or IT 108 or equivalent, and IT 223; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**IT 413 - Digital Media Editing**

Credits: 3 (NR)
Examines three areas of digital media editing - tools for editing, content and logic decision process, and information technology used by major corporations for development and distribution - through video examples from entertainment industry and corporate productions as well as hands-on editing experience.

Prerequisite(s): IT 213 ; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**IT 414 - Database Administration**

Credits: 3 (NR)
Explores advanced concepts of database administration using enterprise-level database management system. Topics include: backup, recovery, corruption, automatic management, resource management, job scheduling, space management, memory management, storage management, diagnosis and corresponding tools.

Equivalent to INFS 414

Prerequisite(s): IT 314 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**IT 415 - Information Visualization**

Credits: 3 (NR)
Provides an overview of information visualization applications in intelligence analysis, decision support systems, and network monitoring. Covers human factors, human interface with information, and current and future trends in information visualization. Students also learn to develop a rudimentary visualization application.

Prerequisite(s): IT 213 or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
IT 431 - Web II: Advanced Web Development

Credits: 3 (NR)
Continuation of Web I. Rapid Application Development (RAD), client- and server-side scripting for user and database interaction. Students build skills in web application development using different technologies and frameworks. Topics such as session tracking/cookie management, privacy and integrity issues, and web services are also covered.

Prerequisite(s): IT 206 or IT 108, and IT 331, or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 435 - Applied Knowledge Technologies for the Semantic Web

Credits: 3 (NR)
Methods, languages, and tools related to the knowledge technologies for semantic web from an applied perspective. Combines survey lectures with in-depth presentation of relevant issues and hands-on experience with existing technologies.

Prerequisite(s): IT 331; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 441 - Network Servers and Infrastructures

Credits: 3 (NR)
Covers IP networking concepts and practices for using DHCP, DNS, secure communication, routing, remote address services, web servers, and network connectivity between operating systems. Students learn TCP/IP, routing architecture, and understand application-level services used in Internet. Through networking lab sessions, students focus on using switches and routers connected in LANs and WANs.

Prerequisite(s): Junior level standing and IT 341, MATH 108 and either of MATH 112 or MATH 125; or permission of department. Prerequisite enforced by registration system.

Notes: Term project.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 445 - Advanced Networking Principles

Credits: 3 (NR)
This course focuses on Layer 2 and 3 of the OSI model and WAN technologies. Frame Relay and ISDN, complex router configurations of Variable Length Subnet Masking (VLSM), Classless Inter-Domain Routing (CIDR), Network Address Translation (NAT), Dynamic Host Configuration Protocol (DHCP), and study of Network Management Systems available for Data Communications Networks. Layer 2 involves Ethernet-switching components, including detailed hands-on configuration
covering all aspects of switches using the command-line interface method.

Prerequisite(s): IT 341; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 455 - Wireless Communications and Networking

Credits: 3 (NR)
Covers fundamental principles underlying wireless data communications. Topics include wireless transmission basics, radio propagation issues, antennas, digital modulation, spread spectrum techniques and their applications, and popular standards: WiFi, WiMAX and Bluetooth. Also presents practical knowledge to enable the design, testing, deployment, debugging and commissioning of WiFi, WiMAX networks and point-to-point microwave systems. Discussions on cellular network technologies are also included.

Prerequisite(s): IT 101 and IT 341; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 462 - Information Security Principles

Credits: 3 (NR)
Studies security policies, models, and mechanisms for secrecy, integrity, availability, and usage controls. Topics include models and mechanisms for mandatory, discretionary, and role-based access controls; authentication technologies; control and prevention of viruses and other rogue programs; common system vulnerabilities and countermeasures; privacy and security policies and risk analysis; intellectual property protection; and legal and social issues.

Equivalent to INFS 462

Prerequisite(s): IT 212 or equivalent, and IT 223; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 466 - Network Security II

Credits: 3 (NR)
Detailed study of certain symmetric and asymmetric cryptographic schemes; analysis of network data (including "packet sniffing"); security at different network layers (including IPSec, SSL/TLS and Kerberos); and secure e-commerce. Teaches principles of designing and testing secure networks, including use of network partitioning, firewalls, intrusion detection systems, and vulnerability assessment tools.

Equivalent to INFS 466

Prerequisite(s): IT 206 or IT 108 or equivalent, IT 223, IT 341, IT 366; and either of MATH 112 or MATH 125; or permission
of department. Prerequisite enforced by registration system.

**IT 467 - Network Defense**

Credits: 3 (NR)
Practices and procedures for defending business-class, heterogeneous networks against threats (including system failure, environmental events, human error) and attacks (including intrusion, malicious software, denial of service). Through practical lab sessions, students receive real-world experience designing networks, installing and configuring system components, detecting and recovering from problems and attacks, and gathering data to support prosecution of offenders and refinement of countermeasures.

Prerequisite(s): IT 366, or permission of instructor.

**IT 471 - Applications of Digital Technologies**

Credits: 3 (NR)
The course covers an overview of technologies and applications of a wide array of digital components used within state of the art IT systems. Topics include an understanding of the applications of such digital devices embedded within telecommunications systems, storage systems, computing systems, multimedia systems, and computer networks.

Prerequisite(s): IT 101 and at least Junior standing in program; or permission of department. Prerequisite enforced by registration system.

**IT 481 - Concepts of Multimedia Processing and Transmission**

Credits: 3 (NR)
Covers fundamentals of audio and image processing and transmission. Technical topics include audio and video compression algorithms for efficient storage and transmission of multimedia content, streaming video, high definition video, multimedia storage technologies. Other issues discussed include legal aspects concerning distribution of multimedia content, multimedia standards, the entertainment industry as well as the future of multimedia processing and transmission.

Prerequisite(s): IT 101 and IT 213; or permission of department. Prerequisite enforced by registration system.
IT 484 - Voice Communications Technologies

Credits: 3 (NR)
Exames current and emerging technologies for transmission of voice signals over telecommunications systems. Highlights significant differences between the requirements for voice and other forms of data. Topics provide a balance between traditional voice technologies and those that use data networks. Real-world implementations are analyzed to determine reliability, quality, and cost effectiveness. Includes lab experiments with analog and digital technologies.

Prerequisite(s): IT 300 and IT 341; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 488 - Fundamentals of Satellite Communications

Credits: 3 (NR)
Provides a comprehensive overview of the principles of satellite communications systems. Major topics include satellite orbits and constellations, the space segment, antennas, modulation, coding, satellite access methods and link analysis. Also covers satellite applications, with emphasis on recent developments in the satellite communications field. Hands-on design experience is gained through the use of readily available vendor software systems.

Prerequisite(s): IT 300, IT 341, and MATH 108; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 492 - Senior Design Project I

Credits: 3 (NR)
Students use information technology as a tool to redesign business processes so the enterprise can achieve its objectives. Student teams analyze the business processes of real organizations, quantify the negative impact caused by current process challenges, then develop and present a compelling Business Case for Change. Students develop skills critical for preparing and delivering effective verbal briefings and presentations.

Fulfills general education requirement in synthesis.

Prerequisite(s): Senior standing in BS information technology program, IT 343, and completion or concurrent enrollment in all other required general education courses; or permission of department. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IT 493 - Senior Design Project II

Credits: 4 (NR)
Students, in teams, complete projects demonstrating preparedness as an IT professional. This work includes ethical challenges,
status reports and engineering notebooks evaluated during class. Teams members develop detailed designs, build solutions up to Beta, present final written reports and final verbal presentations before review panels of business leaders. Students must register for the section that continues their IT 492 section.

**Prerequisite(s):** IT 492, IT 343, senior standing (90 credits) in BS in information technology program, and all general education requirements completed; or permission of department. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 0

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**IT 495 - Turning Ideas into Successful Companies**

Credits: 3 (NR)  
This is a practical course in entrepreneurship. Each class session will focus on specific topics associated with building a business: team creation, business planning, market research, product development, financial planning, funding, people and organizations, competitive strategies, operations, growth and exit strategies, and more. Students will have reading assignments and will participate in competitive team assignments.

**Prerequisite(s):** Senior standing or permission of department.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**IT 498 - Independent Study in Information Technology**

Credits: 1-3 (RT)  
Directed self-study of special topics of current interest in IT.

**Notes:** Topics must be arranged with instructor and approved by department chair before registering. Maximum 3 credits.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

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**IT 499 - Special Topics in Information Technology**

Credits: 3 (RT)  
Topics of special interest to undergraduates.

**Prerequisite(s):** Permission of department; specific prerequisites vary with nature of topic.

**Notes:** May be repeated for maximum 6 credits if topics are substantially different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
IT 796 - Directed Reading and Research

Credits: 1-6 (NR)
Reading and research on specific topic in information technology under direction of faculty member.

Prerequisite(s): Permission of Chair.

Notes: May be repeated as needed.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0

IT 797 - Directed Reading and Research

Credits: 1-3 (NR)
Reading and research on specific topic in information technology under direction of faculty member.

Notes: May be repeated as needed.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

IT 990 - Dissertation Topic Presentation

Credits: 1 (NR)
Students put together a professional presentation of a research proposal and present it for critique to fellow students and interested faculty. May be repeated with change of research topic, but credit toward doctoral degree is given once.

Equivalent to CS 990, STAT 990

Prerequisite(s): Completion of all course requirements for PhD, or permission of instructor.

Notes: May be repeated with change in topic, but degree credit is given only once.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Graduate Special

IT 991 - Engineer Project Presentation

Credits: 1 (RD)
Opportunity for engineer degree students to present project proposal for critique to interested faculty and students. Covers presentation of project topic for engineer degree in information technology, and is required of all engineer degree students. Students complete project proposal.

Prerequisite(s): Completion of all course requirements for engineer degree in information technology, or permission of
instructor.

**Notes:** May be repeated with change in topic, but degree credit is only given once.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

**IT 996 - Engineer Project Proposal**

Credits: 1-6 (RD)  
Work on project proposal that forms basis for dissertation for engineer degree.

**Prerequisite(s):** Completion of all course requirements for the Engineer degree in Information Technology and permission of Project Director. Students must submit a Project Proegree Report form to the Graduate Student Service Office.

**Notes:** May be repeated. No more than 12 credits of IT 996 and 997 may be applied to engineer degree requirements.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit

**IT 997 - Engineer Project Dissertation**

Credits: 1-6 (RD)  
Formal record of commitment to engineer project dissertation under direction of advisory committee in information technology.

**Prerequisite(s):** Admission to candidacy.

**Notes:** May be repeated as needed.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit

**IT 998 - Doctoral Dissertation Proposal**

Credits: 1-12 (RD)  
Work on research proposal that forms basis for doctoral dissertation.

**Notes:** May be repeated. No more than 24 credits of IT 998 and 999 may be applied to doctoral degree requirements.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit
IT 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Formal record of commitment to doctoral dissertation research under direction of faculty member in information technology.

Prerequisite(s): Admission to candidacy.

Notes: May be repeated as needed.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

Initiatives in Educational Transformation-Teaching (IETT)

Offered by the College of Education and Human Development

IETT 500 - Introduction to IETT

Credits: 0 (NR)
Introduces students to the ideas and the experiential pedagogy of the IET program in an intensive summer session designed to develop relationships among participating educators and faculty by building a vibrant learning community through shared and emerging knowledge and experience.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Not Gradable

IETT 750 - Studies in Language and Culture I

Credits: 3 (NR)
Explores the interdependence and mutual construction of languages and cultures, as well as how both provide interpretive frames and thus mediate lived experiences. Investigates culture and language as primary shapers of relationships and identities. Engages teachers in constructing culturally responsive curriculum and pedagogy.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

IETT 751 - Studies in Language and Culture II

Credits: 3 (NR)
Deepens understandings of how language and culture shape interpretations that affect people's lives. Investigates student achievement in relationship to classroom experiences and the language and cultural knowledge students bring to school. Examines vernacular discourses, including those in cyberspace and popular culture, while considering pedagogical implications. Probes social justice issues in and out of educational institutions.
IETT 752 - Research in Practice: The Team Project

Credits: 6 (NR)
Builds further understanding of teacher research with an emphasis on collaborative research process to develop skills, construct knowledge, and transform practice. Teams engage in collaborative inquiry as they form and frame salient questions, take actions to improve teaching and learning, gather, analyze and interpret multiple forms of data, and share their experience in communities of practice.

Prerequisite(s): MNPE 704

IETT 753 - Teaching and Learning

Credits: 3 (NR)
Provides a structured opportunity for offering evidence of individual growth and transformation of professional practice. Through a process of deep reflection, examines fundamental philosophical and pedagogical assumptions, explores individual educational experiences, and critically examines professional practices related to meeting K-12 students' needs, continuous improvement, and program experiences.

IETT 754 - Introduction to Teaching Historic Places with Diverse Populations

Credits: 1 (NR)
Explores and interprets national, regional, and local historic sites in the Washington DC area, students will practice historical thinking and teaching through an analysis of historic sites as primary sources.

Corequisite(s): MNPE 700; MNPE 703

IETT 755 - Advanced Teaching Historic Places with Diverse Populations

Credits: 2 (NR)
Building on the exploration and interpreting skills learned in IETT 754, students will practice historical thinking and teaching for
diverse P-12 classroom populations to convey critical thinking skills and civic engagement.

**Prerequisite(s):** IETT 754.

**Corequisite(s):** IETT 750.

**Hours of Lecture or Seminar per week:** 1.5  
**Hours of Lab or Studio per week:** 0.5  
**When Offered:** Fall

## Instructional Technology (EDIT)

Offered by the College of Education and Human Development

### EDIT 401 - Introduction to Learning Technologies

Credits: 3 (NR)  
Provides an overview of the principles and tools used within the fields of e-learning, instructional design, and multimedia/hypermedia technologies. Students apply knowledge and skills learned by creating an e-learning module.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDIT 410 - Introduction to Assistive Technology

Credits: 3 (NR)  
Provides an understanding of assistive technology and application in instructional programs, career tasks, and life skills for persons with disabilities. Presentation and demonstration experiences enable students to better use assistive technology in education, work, community, and home environments.

**Notes:** Knowledge and awareness components may be delivered via distance education.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDIT 412 - Assistive Technology for Individuals with Sensory Impairments

Credits: 2 (NR)  
Provides technology and resources available to enhance and improve the ability of individuals with visual and hearing impairments for success in school, daily living activities, and employment.

**Notes:** Class components may be delivered via distance education.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0
EDIT 413 - Technology, Society, and the Culture of Learning

Credits: 3 (NR)
Explores the relationship between technological change and education reform initiatives. Emphasis will be placed on the ways in which technological and social changes influence and shape the goals and outcomes of the K-12 educational process.

Prerequisite(s): EDUC 300.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 423 - Accessibility/Input Modifications

Credits: 2 (NR)
Explores accessibility/input devices and strategies used by individuals with disabilities for accessing computers, independent living aids, driving equipment, and communication devices.

Notes: Class components may be delivered via distance education.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EDIT 425 - Software for Individuals with Special Needs

Credits: 2 (NR)
Provides software evaluation and design for individuals with disabilities. Students will create a software program using existing authoring tools for a person with a disability.

Notes: Class components may be delivered via distance education.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EDIT 426 - Web Accessibility and Design

Credits: 3 (NR)
Provides instruction for accessible web design using HTML and existing authoring tools. Section 508 web accessibility standards and assistive technologies to access the computer will be explored.

Notes: Class may be delivered via distance education.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDIT 428 - Low-Technology Assistive Technology Solutions

Credits: 1 (NR)
Provides functional application of low-technology solutions within the areas of self-care; mobility and transfer; communication; stability and support; sports, recreation, and leisure; and academic and work environments. Will include opportunities to create low-technology devices.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDIT 504 - Introduction to Educational Technology

Credits: 3 (NR)
Examines uses of and issues in educational technology. Explores curriculum integration of technology, and focuses on learning and using commercially available applications software.

Notes: Field experience in public schools will be required during course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 510 - Introduction to Assistive Technology

Credits: 3 (NR)
Provides an understanding of assistive technology and application in instructional programs, career tasks, and life skills for persons with disabilities. Presentation and demonstration experiences enable students to better use assistive technology in education, work, community, and home environments. Knowledge and awareness components may be delivered via distance education.

Equivalent to EDSE 510

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 522 - Assistive Technology for Individuals with Sensory Impairments

Credits: 2-3 (NR)
Focuses on professionals or students interested in serving visually impaired/blind or hearing impaired/deaf populations. Heightens awareness of participants to specific technology and resources available to enhance and improve ability of individuals with impairments to succeed in school, daily living activities, and employment. Knowledge and awareness components may be delivered via distance education.

Equivalent to EDSE 522
EDIT 523 - Accessibility/Input Modification

Credits: 1-3 (NR)
Provides overview of accessibility/input modifications and strategies. Students explore various input devices and their application and use by individuals with disabilities. Opportunities for in-depth exploration of sophisticated access technologies available to those students who seek expertise in specific assistive technology devices. Knowledge and awareness components may be delivered via distance education.

Equivalent to EDSE 523

EDIT 524 - Assistive Technology for Individuals with Learning Disabilities

Credits: 2 (NR)
Focuses on strategies and techniques for implementing software and other technologies in lives of individuals, age 3 to adult, with learning disabilities. Students develop and implement plans for assistive technology. Requires practicum. Knowledge and awareness components may be delivered via distance education.

Equivalent to EDSE 524

EDIT 525 - Software for Individuals with Special Needs

Credits: 1-2 (NR)
Focuses on software evaluation and design for individuals with disabilities. Explores existing software resources, and identifies design features to meet individual's special needs. Students create software program for person with disabilities (credit 2). Knowledge and awareness components may be delivered via distance education.

Equivalent to EDSE 525

EDIT 526 - Web Accessibility and Design

Credits: 3 (NR)
Develops understanding of principles of universal web design. Students apply this understanding by designing and developing
accessible web site using web authoring tools.

Equivalent to EDSE 526

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDIT 529 - Internet as an Assistive Technology Tool**

Credits: 2 (NR)
Overview of web and Internet as an educational tool for students with disabilities. Focuses on presentation of strategies, accommodations, assistive technology, and Internet resources for educators. Students review and evaluate web sites, and develop accessible Internet lesson plan or web site.

Equivalent to EDSE 529

Prerequisite(s): HTML experience.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**EDIT 530 - Scripting and Programming**

Credits: 2 (RT)
Enables development of computer-based educational materials using widely known educational scripting language. Students explore basic authoring capabilities, and learn to apply those capabilities by designing and producing materials using commands, procedures, and functions of scripting language.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**EDIT 561 - Teaching with Telecommunications**

Credits: 1 (NR)
Develops expertise with various aspects of telecommunications tools, and models ways these tools can be used for personal learning and integration into teaching/learning process. Addresses e-mail, Internet, web, and online databases.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**EDIT 562 - Teaching with Databases**

Credits: 1 (NR)
Develops expertise with various aspects of databases, and models ways databases can be integrated into teaching and learning
process. Focuses on strategies for searching, sorting, creating, and communicating with information, much of which is structured by variety of online and offline databases.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**EDIT 563 - Teaching with Graphics**

Credits: 1 (NR)  
Explores various graphic programs available for constructing visual images. Addresses draw and paint programs, scanning and editing images, and using visual communication to support K-12 learning.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**EDIT 564 - Teaching with Web 2.0**

Credits: 2 (NR)  
Develops expertise with social, cognitive, and learning implications of film, video, and television. Engages students in process of planning, storyboarding, and filming with video.

**Prerequisite(s):** EDIT 561.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

**EDIT 565 - Teaching with Educational Software**

Credits: 1 (RD)  
Explores variety of educational software, including simulations, problem-solving software, computational tools (calculators, probeware, LOGO, and spreadsheets), and drill-and-practice/integrated learning systems. Emphasizes ways these programs support K-12 teaching and learning process.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**EDIT 566 - Teaching with Multimedia/Hypermedia**

Credits: 2 (RD)  
Covers variety of hypertext/hypermedia and multimedia tools. Emphasizes students' ability to use tools and then teach others. Covers the ways integration of tools in K-12 curriculum support learning, and difference between hypermedia and multimedia.

**Prerequisite(s):** EDIT 563.
EDIT 567 - Teaching with Desktop Publishing

Credits: 2 (RD)
Explores variety of publishing tools, including word processors, desktop publishers, and idea processors. Emphasizes using tools to communicate. Covers design and layout principles, appropriate use of images to facilitate communication, and ways K-12 teachers can design opportunities for students to learn concepts.

Prerequisite(s): EDIT 563.

EDIT 568 - Teaching with the Web

Credits: 2 (NR)
Examines the various aspects of web-based learning and the ways these tools can be integrated into the teaching/learning process. The course is taught online.

Prerequisite(s): EDIT 561

EDIT 571 - Tools for Visual/Graphic Design

Credits: 1-3 (RT)
Teaches basic knowledge of tools available for integrating graphics and visual design into computer-based instruction. Exposes students to latest tools available for developing, integrating, and managing visual and graphic display.

EDIT 572 - Tools for Digital Video and Audio

Credits: 1-3 (RT)
Overview and exploration of using these tools in instructional design process. Offers rationale for using select tools and developing skills to use them.
EDIT 573 - Project Management Tools

Credits: 1-3 (RT)
Teaches students the principles of project management as it is applied to instructional design. Explores project management tools used to manage, plan, and track large-scale multimedia and hypermedia projects.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

EDIT 574 - Networking Tools

Credits: 1-3 (RD)
Teaches basic knowledge of current networking and telecommunications devices used to enhance instructional design process. Covers local area networks, telecommunications, and teleconferencing and distance education technologies.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

EDIT 575 - Authoring Tools

Credits: 1-3 (RT)
Introduces specific authoring tools through hands-on lab instruction, interaction with software interface, construction of instructional sequences, importing video and audio clips, resource management, and animation.

Notes: Content customized to particular software tool presented.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

EDIT 590 - Educational Research in Technology

Credits: 3 (NR)
Focuses on developing skills, insights, and understanding basics to performing research with emphasis on interpretation, application, critique, and use of findings in educational settings. Students develop expertise in action research methodology, design, and implementation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 593 - Instructional Hardware Systems

Credits: 3 (NR)
Teaches basic technical features of computer-based hardware systems used in educational settings, including stand-alone computers, peripheral devices, and networking systems.
EDIT 597 - Special Topics in Education

Credits: 1-6 (RT)
Provides advanced study on selected topic or emerging issue in American or international education.

Notes: May be repeated for credit with GSE permission.

EDIT 601 - Instructional Design and Development (IDD) Portfolio

Credits: 1 (NR)
Enables students to create and publish electronic portfolio that demonstrates effective and meaningful integration and syntheses of instructional design and development concepts, principles, and competencies learned across program courses at mid-degree program point.

Notes: To be taken at mid-degree program point with minimum 12 and maximum 15 credits.

EDIT 611 - Innovations in Distance Learning

Credits: 3 (NR)
Explores educational opportunities through electronic networks and telecommunications. Hands-on activities focus on planning, implementation, and evaluation. Students discuss emerging applications, and how new approaches to learning can be integrated into today's classrooms.

EDIT 641 - Understanding Virtual Schools

Credits: 1 (NR)
Develops knowledge about online learning for K-12 students. Examines history and trends of online learning, and characteristics of K-12 virtual learners.
EDIT 642 - The Online Academy

Credits: 1 (NR)
Develops knowledge about Mason's virtual high school. Focuses on design model with attention to representative problems, performances of understanding, communities of practice, and mentors.

Prerequisite(s): EDIT 641
Corequisite(s): EDIT 641

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDIT 643 - Online Mentoring I: Building Virtual Relationships

Credits: 1 (NR)
Assists in developing online mentoring skills related to integral role that building relationships plays in success of online learning.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDIT 644 - Online Mentoring II: Promoting Self-Regulation

Credits: 1 (NR)
Assists in developing online mentoring skills related to integral role that self-regulation plays in success of online learning.

Prerequisite(s): EDIT 643

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDIT 645 - Online Mentoring III: Conceptual Learning

Credits: 1 (NR)
Assists in developing online mentoring skills related to role of support of conceptual and content understanding in success of online learning.

Prerequisite(s): EDIT 644

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
EDIT 646 - Online Mentoring IV: Moderating

Credits: 2 (NR)
Assists in developing expertise with moderating student learning asynchronous and synchronous in online environments including discussion boards, chat rooms, and general communication patterns.

Prerequisite(s): EDIT 645 or permission of instructor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EDIT 701 - Advanced Instructional Design and Development (IDD) Portfolio

Credits: 1 (NR)
To be taken in the last semester of course work. Enables students to create and publish electronic portfolio that demonstrates effective and meaningful integration and syntheses of instructional design and development concepts, principles, and competencies learned across program courses at end degree program point.

Prerequisite(s): EDIT 601. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDIT 704 - Instructional Technology Foundations and Theories of Learning

Credits: 3 (RD)
Reviews practical and pedagogical issues related to design and development of technological instruction. Emphasizes investigating instructional design as a field and community of practice, and reviewing core learning theory constructs applicable to design of instructional technology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 705 - Instructional Design

Credits: 3 (NR)
Helps students analyze, apply, and evaluate principles of instructional design to develop education and training materials spanning a wide range of knowledge domains and instructional technologies. Focuses on variety of instructional design models, with emphasis on recent contributions from cognitive science and related fields.

Equivalent to EDCI 705

Prerequisite(s): Teaching experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDIT 711 - Teaching with Technology I: Telecommunications and Databases

Credits: 3 (RD)
Explores and develops expertise with various aspects of telecommunications and databases, and models how tools can be used for personal learning and integration into teaching and learning process. Addresses e-mail, Internet, and web, and online and multimedia databases. Also focuses on strategies for searching, sorting, creating, and communicating with information, many of which are structured by online and offline databases.

Corequisite(s): EDCI 710.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 713 - Teaching with Technology II: Graphics, TV and Video, and Simulations

Credits: 3 (RD)
Explores and develops expertise with various graphic programs for constructing visual images, interpreting and creating video, and structuring and using simulations for learning. Addresses draw and paint programs, scanning and editing images, and using visual communication to support K-12 learning. Explores social, cognitive, and learning implications of film, video, and television, and engages students in planning, storyboarding, and filming with video. Also focuses on various categories of simulation, relationship between simulations and ways of knowing, and strategies for using simulations to promote K-12 learning.

Corequisite(s): EDCI 712.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 715 - Teaching with Technology III: Publishing and Computational Tools

Credits: 3 (RD)
Explores and develops expertise with variety of publishing tools, including word processors, desktop publishers, and idea processors. Emphasizes using tools to communicate. Covers design and layout principles, appropriate use of images to facilitate communication, and ways K-12 teachers can design opportunities for students to learn these concepts. Also helps students explore and develop expertise with tools commonly used as part of "computational science" and mathematical modeling. Tools include programming languages such as LOGO, calculators, spreadsheets, probeware, and graphing calculators.

Corequisite(s): EDCI 714.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 717 - Teaching with Technology IV: Hypermedia and Emerging Technologies
Develops expertise with hypertext/hypermedia and multimedia tools. Emphasizes ability to use tools and then teach others. Focuses on understanding difference between hypermedia and multimedia. Also examines educational technologies expected to become important applications soon, including virtual reality and distributed learning.

**Corequisite(s):** EDCI 716.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDIT 719 - Tools 5: Web 2.0 and Digital Video Editing**

Credits: 3 (NR)  
Explores emerging Web2 tools (blogs, wikis, and podcasts) and digital video with attention to conceptual understanding and potential applications in K-12 settings. Culminates in the design and development of products and lesson plans for K-12 settings.

**Prerequisite(s):** EDIT 717.  
**Corequisite(s):** EDCI 716.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDIT 720 - Leadership Issues in Educational Technology**

Credits: 3 (NR)  
Examines how educational technology can provide infrastructure for creating, managing, and evaluating innovative types of teaching and learning environments. Explores new assumptions about learning, instructional technology, and organizational development as foundation for planning how schools can use technology to evolve beyond conventional approaches.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDIT 721 - Web-Based Learning**

Credits: 3 (NR)  
Examines web-based learning and how these tools can be integrated into the teaching/learning process in K-12 settings.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDIT 725 - Technology and Diversity**
Focuses on technology to support learning needs of all students, including English-as-a-second-language, bilingual, and special-needs students. Emphasizes helping teachers use technology to support learning when faced with such diverse learners in one classroom.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDIT 730 - Advanced Instructional Design

Credits: 3 (NR)  
Capstone course of three-course sequence on theory and practice of instructional design. Helps students apply ideas developed in prior courses to complete major instructional design project. Covers leading-edge ideas in evolution of instructional design.

Prerequisite(s): EDCI/EDIT 705

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDIT 732 - Analysis and Design of Technology-Based Learning Environments

Credits: 3 (NR)  
Enables design, implementation, and evaluation of technology-based education and training materials using advanced computer-based authoring tools.

Prerequisite(s): EDIT 730 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDIT 742 - Interactive Technologies: Gaming and Robotics

Credits: 3 (NR)  
Project-based, hands-on course focusing on technology, science, and engineering. LEGOS, controlled by small microcomputers, used to show principles behind many technological innovations. Other technological advances explored.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDIT 745 - Technology Leadership Issues

Credits: 3 (NR)  
Explores relationship of leadership, innovations, change, and technology advocacy. Emphasizes implementation of ideas and strategies to influence decisions of policy makers. Explores sources of grant funding, and interaction with professional
organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 746 - Educational Technology and Assessment

Credits: 3 (NR)
Covers fundamentals of educational assessment and measurement, and relates them to current attempts to use technology for educational assessment. Explores use of computer technology to support traditional testing and innovative ways to assess complex learning.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 747 - Technology and Teacher Development

Credits: 3 (NR)
Investigates latest research and issues related to teacher education to include staff development in K-12 in-service as well as university courses. Students paired with preservice teachers who act as online mentors to develop leadership and mentoring skills.

Prerequisite(s): EDIT 590 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 748 - TIP 2 Technology Innovations Project

Credits: 3 (NR)
Continuation of design and development of EDIT 741 technology-enriched learning module. Students conduct action research, and implement advanced action research project.

Prerequisite(s): EDIT 741 and 590.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 750 - Emerging Educational Technologies

Credits: 3 (NR)
Examines range of educational technologies expected to become important applications in three to eight years. Assesses potential of these emerging technologies to improve practice and alter mission and content of education, and helps students develop skills in strategic planning.
EDIT 752 - Design and Implementation of Technology-based Learning Environments

Credits: 3 (RD)
Students design and produce multimedia/hypermedia applications based on current theory and research in instructional design and cognitive science. Examines user needs, information models, structure, and media selection and uses to inform design and production of final project.

Prerequisite(s): EDIT 732 or permission of instructor. Prerequisite enforced by registration system.

EDIT 771 - Overview of Digital Media

Credits: 1-3 (NR)
Provides overview of media and technology tools used in teaching, learning and training. Focuses on developing skills necessary to implement digital media approaches using a systematic design process.

EDIT 772 - Web-Based Instructional Tools

Credits: 1-3 (RT)
Provides overview of web development tools. Using instructional design principles, students interact with variety of web publishing software programs to develop a project web site.

EDIT 773 - Human Computer Interface Design for Teaching and Learning

Credits: 3 (RD)
Provides overview of human-computer interface issues related to instructional design of technology-centered learning environments. Examines continuum of human-computer feedback.
EDIT 790 - Practicum in Instructional Technology

Credits: 1-6 (RD)
Provides supervised practice in applying knowledge and skills of student's chosen track through placement in appropriate work setting.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDIT 791 - Project Development Practicum

Credits: 6 (NR)
Designed for students in immersion concentration of Instructional Technology program. Allows students to join design team focusing on analysis and design phase of instructional design process and development process.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

EDIT 792 - Project Development Practicum

Credits: 6 (NR)
Designed for students in immersion concentration of Instructional Technology program. Allows students to join design team focusing on development and evaluation phase of instructional design process and development process.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

EDIT 797 - Advanced Topics in Education

Credits: 1-6 (RD)
Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.

Notes: May be repeated for credit with CEHD approval.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDIT 801 - Nature and Process of Design
Examines multi- and cross-disciplinary perspectives on the nature and process of designing and developing learning technologies.

Prerequisite(s): EDCI 716, EDIT 752, or EDSE 649

Corequisite(s): EDIT 802 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 802 - Cognition and Technology: A Multidisciplinary Approach

Credits: 3 (NR)
Examines learning interactions between cognition and technology using multiple disciplinary perspectives including, cognitive science, psychology, neuroscience, education, design theory, instructional design, technology design, anthropology, sociology, information science, philosophy, semiotics, and linguistics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDIT 803 - Design-Based Research

Credits: 3 (NR)
Provides an introduction to systematic cycles of design-based research in education. Applicable to all content domains to explore cycles of research within design, development and implementation of educational and training interventions.

Prerequisite(s): EDIT 801

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

EDIT 891 - Design Research Practicum

Credits: 1-9 (RD)
Applies multiple design research cycles to an identified research problem to systematically test and improve technology-based product interventions or other curriculum/training strategies or materials in order to systematically develop knowledge related to teaching, learning and/or training in context.

Prerequisite(s): EDRS 811, EDRS 812, and EDIT 803 or equivalent

Hours of Lecture or Seminar per week: 1-9
Hours of Lab or Studio per week: 1-12
Grading: Graduate Special
When Offered: Fall, Spring, Summer
EDIT 895 - Emerging Issues in Instructional Technology

Credits: 3 (NR)
Covers selected emerging issues. Examines ways instructional technology provides infrastructure for creating, managing, and evaluating innovative types of teaching-learning environments.

Prerequisite(s): Admission to PhD program, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Interdisciplinary Studies (MAIS)

Offered by the College of Humanities and Social Sciences

MAIS 796 - MAIS ProSeminar

Credits: 1 (NR)
Introduces students to the structure of the MAIS program; students create a portfolio of their work which continues during their studies; the portfolio prepares students for the capstone project or thesis.

Prerequisite(s): Acceptance into the MAIS Program

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

MAIS 797 - Interdisciplinary Studies Proposal

Credits: 1 (NR)
Focused on formulating and writing a MAIS project or thesis proposal.

Prerequisite(s): Admission to MAIS and completion of 21 credits of graduate course work, including any required research methodology course; MAIS 796. ZAL students must have completed 30 credits or have obtained ZAL Director's permission before enrolling in MAIS 797.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

MAIS 798 - Interdisciplinary Studies Project

Credits: 1-5 (RD)
Research project related to student's concentration taken under supervision of faculty advisor and project evaluation committee.
Prerequisite(s): MAIS 797 and prior approval of a project proposal by the committee chair, two committee members, and MAIS director. ZAL student project proposals must have been approved in writing by their institutional supervisor and the ZAL Director.

Notes: Individualized section form required.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: S/NC

**MAIS 799 - Interdisciplinary Studies Thesis**

Credits: 1-5 (RD)
Original research endeavor related to student's MAIS program concentration. Research must result in document meeting MAIS and university standards.

Prerequisite(s): MAIS 797 and prior approval of a thesis proposal by the committee chair, two committee members, and MAIS director.

Notes: Individualized section form required.

Hours of Lecture or Seminar per week: 1-5
Hours of Lab or Studio per week: 0
Grading: S/NC

**International Commerce and Policy (ITRN)**

Offered by the School of Public Policy

**ITRN 500 - Global Political Economy**

Credits: 1-4 (NR)
Foundation course in the ICP program. Explores issues and ideas affecting global security, stability, growth and development from country, regional and thematic perspectives. Introduces students to key concepts, policies, and practices that underpin international commerce, international relations more broadly, and non-governmental transnational activities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 501 - Methods of Analysis for International Commerce and Policy**

Credits: 4 (NR)
Provides the skills necessary to conduct qualitative and quantitative research and analysis of issues related to international commerce and policy. Students obtain practical information on sources of data, their origins, strengths, and weaknesses. Helps develop tools for statistical analysis of data, and includes use of computers for analyzing and displaying information. It covers
major data sources as well and literature and indices related to international policy, including trade data, economics and financial indicators, and development indicators.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ITRN 503 - Investment and Macroeconomics**

Credits: 1-4 (NR)  
Provides overview of basic concepts in macroeconomic theory, as well as mathematical skills, with emphasis on application to problems of contemporary global economy. Covers monetary systems, balance of payments, foreign exchange market, foreign investment and international institutions, and issues in world monetary arrangements.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ITRN 504 - Trade and Microeconomics for International Commerce**

Credits: 1-4 (NR)  
Provides foundation in international economics, and presents fundamentals of international trade, finance, and transactions. Focuses on alternative approaches to understanding international economic system. Topics include classical and neoclassical theories of trade, alternative theories of trade and their extensions, tariffs, customs unions, institutions, and economic development. Students learn to employ appropriate analytical approaches, including graphical analyses, and communicate the results concisely. Throughout, emphasizes relating theory to practical applications.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ITRN 602 - International Financial Institutions and Globalization**

Credits: 3 (NR)  
Examines nature and dynamics of financial interactions between public and private sectors worldwide. Covers aims and actions of international financial institutions in fostering trade and development, with emphasis on emerging economies. Policy issues include devolving political and economic structures, differing resource and cultural endowments, privatization, financial crises, sector imbalances, and equity. Reviews international and domestic financial markets and instruments.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**ITRN 603 - International Trade Relations**

Credits: 3 (NR)  
Examines U.S. role in world economy and evolving global trading system. Analyzes regulatory framework for trade and political dynamics of international trade relations. Particular attention to domestic trading institutions, and global and regional institutions
such as the GATT/WTO, NAFTA, EU, and APEC. Examines debate between free and fair trade advocates, and prospects for U.S. trade policy.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 604 - International Trade and Technology**

Credits: 3 (NR)  
Examines science and technology policies and international trade, with emphasis on relationships and interactions. Assesses roles of science and technology as economic drivers, and explores strategies employed by companies and governments to link research and development to economic growth and competitiveness. Examines research and development systems and technology-related trade policies of United States, Japan, Europe, major developing countries, and selected newly industrialized economies, emphasizing policies affecting trade and technology. Explores specific cases involving interactions among science, technology, and international trade.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 612 - International Business Operations and the Multinational Corporation**

Credits: 3 (NR)  
Examines international business environment and challenges facing companies in conducting operations in increasingly interconnected global marketplace. Focuses on issues of management and organization, and resolution of conflicts that may arise between business organizations and home and host governments. Also focuses on role of multinational corporations in international environment, and impact on global trade, economic development, and political system. Also studies trade and international investment theories and world financial environment. Explores broad issues such as sovereignty of decision making and global impact of business activities.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 701 - Special Topics in International Commerce and Policy**

Credits: 1-3 (RT)  
Offers specialized courses on various aspects of international commerce and policy.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

**ITRN 702 - Special Topics in International Commerce and Policy: Study Abroad**

Credits: 3-6 (RT)  
Provides opportunity for study abroad under supervision of Mason faculty.
Notes: Course topics, content, and locations vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 710 - International Business Transactions: Finance and Investment**

Credits: 3 (NR)
Focuses on techniques for financing trade and payment methods, including letters of credit, counter trade, and other approaches. Covers issues of direct concern in financing international business operations, such as preparing financing proposals, risk insurance, international taxation, pricing policies, and currency conversion and foreign exchange risk management. Introduces foreign direct investment, alliances and acquisitions, joint ventures, and other methods for investing overseas.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 711 - United States Law and Global Trade**

Credits: 3 (NR)
Surveys types of regulations imposed by United States, foreign governments, and international institutions on transnational business activities. Reviews principal regulatory bodies in United States and overseas, and powers and authorities. Covers tariffs and customs regulations; product safety and environmental restrictions; intellectual property, copyright, trademark, and patent regulations; and licensing rules. Also covers special restrictions that may be imposed because of political considerations such as embargoes, munitions controls, and antibribery and antiboycott regulations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 712 - World Trade Organization and Global Trade**

Credits: 3 (NR)
Focuses on legal aspects of international trade regulation by studying international legal and political regime established under WTO, and assessing impact of domestic economic legislation on U.S. trade regulations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 715 - Global Environment and the World Economy**

Credits: 3 (NR)
Examines growing relationship between environmental interdependence and developing world economy. Assesses increased globalization of environmental and health issues with a focus on the impact on those issues on international transactions involving trade and development. Attempts to develop an understanding of relationship of scientific knowledge to global
environment in context of existing political and economic institutions. Emphasizes formulating and assessing policies and structures for corporations, nations, regions, and international organizations. Tensions among free trade, international competitiveness, and regulatory responses are central. Gives attention to practices of nations and international organizations, emerging forms of regional and international cooperation, and growing use of multilateral agreements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 716 - European Union in the International System**

Credits: 3 (NR)
Examines current developments in European market integration from global perspective. Emphasizes impact of single market, and proposed economic and monetary union of United States and other major trading partners. Examines European economic relations with Eastern Europe, former Soviet Union, and Lome Pact countries.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 717 - International Science and Technology**

Credits: 3 (NR)
Examines U.S. science and technology policies (S&T) and structures, as well as those in other leading countries. Assesses functional links between S&T and international transactions focusing on trade, national security, finance, and development assistance. Considers emergence of multilateralism and international institutional arrangements as alternatives to traditional bilateral patterns of cooperation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 718 - Global Economic and Human Development**

Credits: 3 (NR)
Interdisciplinary examination of economic and human development in world economy. Introduces alternative concepts and theories of economic and human development, and analytical frameworks for assessing important issues that arise in development process. Topics include colonialism, economic growth, population, health, education, industrialization, and rural development.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 720 - Regional and Supranational Organizations**

Credits: 3 (NR)
Assesses role of international organizations in international system today, and focuses on wide range of international and regional
economic and political institutions. Emphasizes changing nature of these organizations in relation to nation states, and relationship of international organizations to U.S. national security and economic interests.

**ITRN 731 - Business-to-Business Marketing in International Commerce**

Credits: 3 (NR)
Provides understanding of concepts of international marketing process and international environment within which companies operate.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 734 - Pricing in International Commerce**

Credits: 3 (NR)
Deals with theory and techniques of pricing that enable organizations to effectively pursue marketing and business strategies.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 736 - Sources of Growth in East Asia**

Credits: 3 (NR)
Examines extraordinary economic success of East Asian NIEs and some of their problems. Focuses on understanding proximate sources of growth, role of technological development, and salient political issues.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 738 - Fundamentals of International Marketing**

Credits: 3 (NR)
Offers working knowledge of principles and practices that enable managers to effectively market organizations, products, services, and brands. Emphasizes international dimensions of marketing where appropriate.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 740 - ABCs of Exporting and Importing**
Acquaints students with legal, regulatory, and practical issues in importation and exportation of merchandise. Topics include theoretical framework for government oversight of international movement of goods; legal issues between parties and governments; and practical guidance concerning structuring of import and export transactions to avoid legal and tariff liability.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 742 - Technology Policy and International Strategies**

Credits: 3 (NR)  
Introduces opportunities and problems created for organizations and society by Internet, and policies affecting trajectory of Internet developments. Also covers technological factors in planning horizon; domestic policy and international treaty factors affecting Internet trajectory; and new horizons for Internet applications.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 744 - The Politics of International Competitiveness**

Credits: 3 (NR)  
Provides inquiry into governance problems of public managers and political leaders as they cope with global competitiveness in post-industrial era. Focuses on integrating public and private sectors worldwide, with special emphasis on U.S. role and how it influences such areas as technology transfer, national security, electronic commerce, trade policies, money flows, and human resources.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 750 - Trade and Politics in Eastern Europe and the Former Soviet Union**

Credits: 3 (NR)  
Examines background and recent developments in political, business, and cultural environment confronting American firms seeking to do business in Eastern Europe and former Soviet Union. Emphasizes international trade patterns and relations between these states and United States. Examines modes of doing business in these countries, and unique problems American firms confront. Focuses on privatization, joint ventures, and counter trade.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 752 - Global Business and Policy**

Credits: 3 (NR)  
Focuses on the multinational firm (MNE) and examines the international activities of large companies as well as small and
medium sized enterprises. Assesses how firms strategize across national borders and address the challenges posed by different governance structures, political economies, institutions and cultures. Theoretical concepts are applied to ‘real’ business situations and case studies.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**ITRN 754 - International Commercialization of Space**

Credits: 3 (NR)  
Identifies and analyzes problems and transactions concerning privatization and commercialization of transnational space activities, including launch and satellite operations. Emphasizes interplay of new technologies with existing legal, political, and business structures in formulating viable commercial satellite and launch operations. Focuses on planning and implementing private space actions in conjunction with various public and private international organizations. Sessions focus on interdisciplinary aspects of space commercialization involving technology, finance, tax, insurance, joint venture and business matters, and international legal and national regulatory issues. Guest lecturers include leading business executives engaged in space and satellite operations.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 756 - National Security and the Global Economy**

Credits: 3 (NR)  
Examines impact of globalization and changes in international economic and political systems on concepts of national security. Emphasizes nexus of economic and security concerns in post-Cold War era, with particular attention to emerging issues including trade and economic security, proliferation of advanced military technology and control of weapons of mass destruction, international drug trafficking, and defense conversion. Focuses on implications of changing security requirements on U.S. defense and economic policy and activities.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ITRN 757 - Business and Politics in Emerging Markets**

Credits: 3 (NR)  
Examines developing countries that are major destination points for international financial flows and foreign direct investment. Emerging markets have become a major influence in the world economy both because of the potential for growth and the downside risks from economic crises. The course uses the new institutional economics to analyze the interplay of political, economic, and business conditions. Institutional economics is a combination of economics, economic history, and political science. Topics covered include the politics of economic reform, drivers of globalization and investment, the informal sector, and relationships of risk and reward.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
ITRN 758 - Global Market Planning Practicum

Credits: 3 (NR)
Provides opportunity to develop international market plan for specific industry or service sector. Students consult with industry experts and use key trade databases to develop strategic plan that recommends market entry strategies. Completed market plan submitted to industry experts for use and dissemination.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 759 - Country Risk Analysis

Credits: 3 (NR)
Presents a wide variety of country risk analysis methods used by corporations, financial institutions, governments, international organizations, specialized consulting groups, and publications. These methods are used to design policies, programs, and projects in the international arena. The course explores natural, commercial, economics, political and financial risk. It also provides a conceptual foundation for understanding the sources of risk, the impacts of risk on public and private sector activities, and the ways that risk can be successfully mitigated or managed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 760 - International Environmental Politics

Credits: 3 (NR)
Examines growing concerns related to global environmental issues and problems they pose to domestic, foreign, and international political institutions. Covers major environmental issues including global warming, ozone depletion, cross-border flow of pollution, and threats to biodiversity. Assesses strengths and weaknesses of traditional political institutions in dealing with these issues and providing for sustainable economic development while limiting environmental damage.
Designated a Green Leaf Course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 761 - European Political and Economic Union

Credits: 3 (NR)
Examines movement for European integration since World War II, focusing on political and institutional development of European Community/Union. Topics include theories of European integration, Treaties of Rome, Single European Act, Maastricht Treaty, European Union (EU) policies and programs, and EU's external relations. Analyzes changing nature of U.S.-EU relations and prospects for EU enlargement into Central and Eastern Europe.
ITRN 764 - Trade, Investment, and Politics in East Asia

Credits: 3 (NR)
Examines issues related to international transactions involving Korea, China, Taiwan, and Hong Kong, with some attention to Japan. Focuses on trade and financial relations between these East Asian nations and United States. Assesses impact of culture and domestic political and economic institutions within these states, and roles in regional institutions and in international system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 765 - Trade, Investment, and Politics in Sub-Saharan Africa

Credits: 3 (NR)
Examines role and potential of sub-Saharan Africa in international trading system. Emphasizes political, historical, cultural, and development factors. Focuses on perspectives of U.S. firms and on international institutions trading or investing in region.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 766 - Trade, Investment, and Politics in the Middle East and North Africa

Credits: 3 (NR)
Examines major economic, political, and cultural issues that influence trade and investment relations with Middle East and North Africa. Focuses on roles of international and regional institutions in economic development, and develops understanding of challenges facing region and their implications for formulating trade and investment strategies by U.S. firms.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 767 - Political Economy and Integration in Latin America

Credits: 3 (NR)
Examines contemporary political, economic, and cultural dynamics of Latin American and Caribbean regions. Emphasizes issues and trends that affect U.S.-Latin American political, business, and trade relations, particularly recent political and economic reforms. Examines roles of domestic interest groups and decision-making systems in individual countries, and evolution of regional integration arrangements and integration with international system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ITRN 768 - Global Intellectual Property Rights and International Trade

Credits: 3 (NR)
Examines national and regional systems, international contractual relations (licensing), and the evolving global system for protecting intellectual property. Addresses current international treaty system and the ongoing multilateral efforts to strengthen worldwide intellectual property protection. Examines intellectual property regimes worldwide, including regional and bilateral challenges and opportunities, and relevant U.S. law and policy responses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 769 - International Entrepreneurship

Credits: 3 (NR)
Introduces practical planning approach for small and medium-size entrepreneurial firms seeking to enter international marketplace. Focuses on key business and financial documents related to doing business overseas; and assesses role of language, technology, and information systems in formulating successful business strategy. Role playing and simulated negotiations provide opportunities for students to sharpen business skills.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 770 - International Contract Negotiation

Credits: 3 (NR)
Reviews growing role of arbitration in international transactions. Examines international, national, and government arbitration bodies, with particular emphasis on how differing cultural characteristics affect negotiating behavior and effectiveness of arbitration.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 771 - Trade, Investment, and Politics in South and Southeast Asia

Credits: 3 (NR)
Focuses on trade and finance issues in the most dynamic countries of South and Southeast Asia. Assesses cultural and political factors, regional trade patterns, and institutions, focusing on implications for regional development and business opportunities for U.S. firms.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 772 - International Telecommunications
Credits: 3 (NR)
Focuses on developments in international telecommunications and satellite regulation. Examines regulatory environment, and business and financial aspects of global telecommunications industry.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 773 - International Strategic Management**

Credits: 3 (NR)
Presents comprehensive approach to international strategy formulation, implementation, and evaluation processes affecting policy and program development within multinational firms and government agencies. Integrates marketing, finance, accounting, and management. Covers techniques for forecasting international business, political, economic, technological, legal, and sociocultural forces.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 780 - Internship**

Credits: 1-3 (NR)
Provides practical work experience in state, federal, or international agencies or private sector. Requires written project integrating work experience and academic program.

Prerequisite(s): Permission of Department and Advisor. Majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

**ITRN 790 - Independent Study**

Credits: 1-3 (RT)
Provides opportunity to pursue intensive research in area of interest not covered by other courses.

Prerequisite(s): Permission of Department and Advisor. Majors only.

Notes: Note: Not all courses earn 3 graduate credits. Some courses may vary in length and thus, in credits earned. Some course requirements subject to change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**ITRN 791 - Advanced Trade Policy**
Credits: 3 (NR)
Covers international trade theory, trade policy analysis, regional economic integration, and institutional arrangements governing world trade. Examines dispute settlement regimes, and relationship between trade and environment. Includes WTO and constituent agreements in the areas of goods, services, intellectual property, and trade-related investment measures.

Prerequisite(s): Permission of instructor required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITRN 795 - Final Project

Credits: 1-3 (RD)
Includes writing 40-page capstone paper that draws together key themes of program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

Italian (ITAL)

Offered by the College of Humanities and Social Sciences

ITAL 101 - Elementary Italian I

Credits: 3 (NR)
Designed for students with no prior knowledge of Italian. Includes elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Students may not receive credit for ITAL 101 and ITAL 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ITAL 102 - Elementary Italian II

Credits: 3 (NR)
Continuation of ITAL 101.

Prerequisite(s): ITAL 101 or permission of instructor.

Notes: Students may not receive credit for ITAL 102 and ITAL 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
ITAL 110 - Elementary Italian

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Students may not receive credit for ITAL 110 and ITAL 101 or 102.

ITAL 201 - Intermediate Italian I

Credits: 3 (NR)
Further development of skills in listening, speaking, and writing.

Prerequisite(s): ITAL 102 or permission of department.

Notes: ITAL 201 and 202 must be taken in sequence. Students may not receive credit for ITAL 201 and ITAL 210.

ITAL 202 - Intermediate Italian II

Credits: 3 (NR)
Application of language skills to reading, composition, and discussion.

Prerequisite(s): ITAL 201 or permission of department.

Notes: Students may not receive credit for ITAL 202 and ITAL 210.

ITAL 210 - Intermediate Italian

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Italian-speaking regions.

Prerequisite(s): ITAL 110 or appropriate placement score.

Notes: Students may not receive credit for ITAL 210 and ITAL 201 or 202.
ITAL 250 - Gateway to Advanced Italian

Credits: 3 (NR)
Development of advanced intermediate-level proficiency with a primary focus on seven major communicative functions: describing, comparing, recommending and expressing opinions, recounting the past, expressing likes and dislikes, hypothesizing, and talking about the future. Examination of authentic materials from various Italian-speaking regions.

Prerequisite(s): ITAL 210; appropriate placement score; or permission of department.

Notes: Taught in Italian.

ITAL 325 - Major Italian Writers

Credits: 3 (NR)
Works of major Italian or Italian-American authors in translation. Writers to be studied vary.

Fulfills general education requirement in literature.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent; or permission of instructor

Notes: Taught in English.

ITAL 330 - Advanced Italian: Language and Culture

Credits: 3 (NR)
Develops linguistic and critical proficiency in Italian language and culture for students who have completed intermediate studies in Italian. Analyzes authentic texts that reveal the diversity of Italian experience in regional, national and international contexts. Fosters advanced reading, writing, speaking, and listening skills that will enable students to understand and to critique Italian with greater ease and sophistication.

Prerequisite(s): ITAL 250; appropriate placement score; or permission of instructor

Notes: Taught in Italian.
ITAL 331 - Advanced Italian Language and Culture

Credits: 3 (NR)
An advanced course that emphasizes linguistic fluency and cultural awareness in contemporary Italian realities. Highlights changes in the domestic, regional, and national spheres.

Prerequisite(s): ITAL 330

Notes: Taught in Italian.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Japanese (JAPA)

Offered by the College of Humanities and Social Sciences

JAPA 101 - Introduction to the Japanese Language

Credits: 3 (NR)
Includes basic grammar, oral expression, listening comprehension, and reading and writing.

Notes: Students may not receive credit for JAPA 101 and JAPA 109 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 102 - Introduction to the Japanese Language

Credits: 3 (NR)
Includes basic grammar, oral expression, listening comprehension, and reading and writing.

Notes: Students may not receive credit for JAPA 102 and JAPA 109 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 109 - Intensive Japanese I

Credits: 6 (NR)
Equivalent to JAPA 101, 102 taught in a single semester.

Notes: Recommended for students who desire intensive introduction to Japanese. Students may not receive credit for JAPA 109 and JAPA 101, 102, or 110.
Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

JAPA 110 - Elementary Japanese

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, reading, and writing.

Notes: Students may not receive credit for JAPA 110 and JAPA 101, 102, or 109.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

JAPA 201 - Intermediate Japanese I

Credits: 3 (NR)
Further development of skills acquired in JAPA 101 and 102, including grammar, oral expression, listening comprehension, reading and writing. Use of written language (katakana, hiragana, and kanji) emphasized.

Prerequisite(s): JAPA 102 or equivalent.

Notes: Students may not receive credit for JAPA 201 and JAPA 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 202 - Intermediate Japanese II

Credits: 3 (NR)
Continuation of JAPA 201.

Prerequisite(s): JAPA 201 or equivalent.

Notes: Students may not receive credit for JAPA 202 and JAPA 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 209 - Intensive Japanese II

Credits: 6 (NR)
Equivalent to JAPA 201, 202 taught in a single semester.

Prerequisite(s): JAPA 102 or 109, or equivalent.
Notes: Students may not receive credit for JAPA 209 and JAPA 201, 202, or 210.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

JAPA 210 - Intermediate Japanese

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Also introduces students to Japanese culture and society.

Prerequisite(s): JAPA 110, appropriate placement score, or permission of instructor.

Notes: Students may not receive credit for JAPA 210 and JAPA 201, 202, or 209.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 250 - Gateway to Advanced Japanese

Credits: 3 (NR)
Development of advanced intermediate-level Japanese language skills in the interpersonal, interpretive, and presentational modes of communication. Incorporates strong component of critical and comparative analysis of Japanese cultural products, practices, and perspectives of the past and the present.

Prerequisite(s): JAPA 210, appropriate placement score, or permission of department.

Notes: Taught in Japanese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 310 - Japanese Culture in a Global World

Credits: 3 (NR)
Study of globalizing Japanese cultural phenomena from the 19th through the 21st century. Explores how movements of ideas, technologies and products across borders influence both local and global ideas and practice.

Fulfills general education requirement in global understanding.

Prerequisite(s): ENGL 101/ENGH 101 or equivalent; or permission of instructor.

Notes: Taught in English. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
JAPA 320 - Japanese Cinema

Credits: 3 (RT)
Comprehensive analysis of Japanese cinema based on cross-cultural perspectives and cultural criticism. Major developments and trends as viewed in selected Japanese films with emphasis on post war and contemporary eras. Knowledge of Japanese history, communication, and cultural studies or film and media studies helpful.

Notes: Taught in English. May be repeated for a maximum of 6 credits when topic is different with approval of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 330 - Advanced Reading and Speaking I

Credits: 3 (NR)
Designed for students to develop conversational proficiency and reading skills. Students work toward a mastery of linguistic and sociolinguistic rules by incorporating reading and speaking abilities through class discussions, reports, and presentations.

Prerequisite(s): JAPA 250, appropriate placement score, or permission of instructor.

Notes: Taught in Japanese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 331 - Advanced Reading and Speaking II

Credits: 3 (NR)
Designed for students to develop conversational proficiency and reading skills. Students continue to develop mastery of linguistic and sociolinguistic rules by incorporating reading and speaking abilities through class discussions, reports and presentations.

Prerequisite(s): JAPA 330, appropriate placement score, or permission of instructor.

Notes: Taught in Japanese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 350 - Readings in Japanese Culture

Credits: 3 (NR)
An integrated content-based Japanese course designed to advance students' oral and writing skills, as well as their critical understanding of Japanese culture and mythology. Introduces a variety of genres, such as rakugo (traditional comical storytelling), shinwa (myths), and mukashi-banashi (folk legends).
Prerequisite(s): JAPA 250, appropriate placement score, or permission of department.

Notes: Taught in Japanese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

JAPA 440 - Integrated Study of Japanese Language and Society I

Credits: 3 (NR)
Integrated approach to study of Japanese language and society through grammar review, vocabulary and kanji development, intensive practice in spoken and written Japanese, and sociological and cultural readings and analysis. Includes class discussion, oral and written reports, and out-of-class direct interactions with native speakers.

Prerequisite(s): JAPA 331, appropriate placement score, or permission of instructor.

Notes: Taught in Japanese.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Kinesiology (KINE)

Offered by the College of Education and Human Development

KINE 100 - Introduction to Kinesiology

Credits: 3 (NR)
Provides an overview of the field of kinesiology in the form of an introductory course. Students gain exposure to: history of the
field, policies and procedures for the concentration, career options, and the model of evidence-based knowledge.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring

**KINE 200 - Principles of Health Related Fitness**

Credits: 2 (NR)  
Provides students with basic knowledge and skills associated with exercise training methods, lifting techniques, and health-related fitness testing procedures. Selection of developmentally appropriate exercises emphasized. Participation in fitness tests required.

**Prerequisite(s):** BIOL 124, BIOL 125, ATEP 300.

**Corequisite(s):** KINE 310.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**KINE 310 - Exercise Physiology I**

Credits: 3 (NR)  
Introduces students to the physiologic, neuroendocrine, and biochemical changes of the human body that are associated with exercise and work.

**Prerequisite(s):** BIOL 124, BIOL 125, ATEP 300.

**Corequisite(s):** KINE 200.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring

**KINE 330 - Seminar in Kinesiology**

Credits: 3 (NR)  
Prepares students for the fieldwork experience in KINE 341: Kinesiology Internship I. Topics covered include: professionalism, review of evidence-based position papers, and discussion of contemporary issues in kinesiology.

**Prerequisite(s):** Junior standing (60 credit hours)  
KINE 100, KINE 200, ATEP 300, KINE 310, KINE 370.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring
KINE 341 - Kinesiology Internship I

Credits: 3 (NR)
Provides a paid or voluntary supervised professional experience in an approved exercise science professional setting under the supervision of a practicum University Supervisor and Agency Supervisor.

Prerequisite(s): KINE 200, KINE 310, KINE 330, KINE 350, KINE 370.
Junior status (60 credits).
Current CPR, AED, and First Aid.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring

KINE 350 - Exercise Prescription and Programming

Credits: 3 (NR)
Provides students with an opportunity to develop an understanding of the assessment and evaluation process used in cardio-respiratory training and anaerobic conditioning for healthy, athletic, and symptomatic populations.

Prerequisite(s): KINE 200
ATEP 300
KINE 310
KINE 370

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

KINE 360 - Strength Training: Concepts and Applications

Credits: 3 (NR)
Provides students with an opportunity to develop an in-depth understanding of the principles of strength training and conditioning, including: anatomical and physiological considerations, lifting techniques, equipment selection, program development/evaluation, and weightlifting safety; thus enabling them to teach and train client.

Equivalent to PHED 364

Prerequisite(s): BIOL 124 and BIOL 125; KINE 300 and 310.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring
KINE 370 - Measurement and Evaluation of Physical Fitness

Credits: 3 (NR)
Provide students with an opportunity to develop a solid understanding of the assessment and evaluation process used in physical education and exercise science.

Equivalent to PHED 365

Prerequisite(s): BIOL 124 and BIOL 125; KINE 300 and 310.

Notes: This is designated a writing intensive course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

KINE 380 - Exercise Prescription and Programming for Special Populations

Credits: 3 (NR)
Provides the study of the pathophysiology of common diseases and conditions with concentration in the design and implementation of exercise programs.

Prerequisite(s): KINE 200, KINE 310, KINE 330, KINE 350, KINE 370; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

KINE 400 - Biomechanics

Credits: 3 (NR)
Focuses on kinetic and kinematic concepts and how they apply to the quantitative assessment of human movement. Analyzes human movement and the functional dynamics of tissue such as muscle or bone.

Prerequisite(s): BIOL 124, 125; KINE 300

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

KINE 410 - Exercise Physiology II

Credits: 3 (NR)
Provides study in the advanced theory of exercise physiology. Knowledge related to the physiologic, neuroendocrine, and biochemical changes of the human body associated with both a single bout of exercise and chronic exercise training will be addressed.
Prerequisite(s): BIOL 124, 125, or BIOL 103, 228; and KINE 310.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer

KINE 420 - Sport and Exercise Nutrition

Credits: 3 (NR)
Explores the fundamental biochemical and physiological rationale for optimal nutrient intake for health, physical fitness, and athletic performance. Specific attention is focused upon the relationship nutrition has with exercise, physical fitness, health, and athletic performance.

Prerequisite(s): HEAL 330
KINE 310

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

KINE 441 - Kinesiology Internship II

Credits: 3 (NR)
Provides a supervised professional experience in two separate approved kinesiology professional settings under the supervision of both a University Supervisor and an Agency Supervisor with emphasis placed upon exercise programming and implementation for both clinical (site 1) and performance (site 2) populations.

Prerequisite(s): 90 credits (Senior status)
KINE 330, KINE 341, KINE 350, KINE 360, KINE 370, KINE 380
Current CPR, AED, and First Aid

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring

KINE 490 - Kinesiology Internship III

Credits: 12 (NR)
Provides a directed, field-based experience, in which students observe and participate in conditions, practices, and settings where sought career roles are conducted. The kinesiology fieldwork coordinator must approve placement for the practicum. Both a University supervisor and an approved agency supervisor with recognized professional certifications coordinate and oversee the student's internship experience.

Prerequisite(s): 90 credits (Senior status)
KINE 330, KINE 341, KINE 400, KINE 410, KINE 420, KINE 441
Current CPR, AED, First Aid Certification
Korean (KORE)

Offered by the College of Humanities and Social Sciences

KORE 110 - Elementary Korean

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

KORE 201 - Intermediate Korean I

Credits: 3 (NR)
Continuation of basic Korean listening, speaking, reading, and writing skills. Online and lab work required.

Prerequisite(s): KORE 102, appropriate placement score, or permission of department

Notes: Students may not receive credit for KORE 201 and KORE 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

KORE 202 - Intermediate Korean II

Credits: 3 (NR)
Continuation of KORE 201. Online and lab work required.

Prerequisite(s): KORE 201, appropriate placement score, or permission of department

Notes: Students may not receive credit for KORE 202 and KORE 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

KORE 210 - Intermediate Korean
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Korean-speaking regions.

**Prerequisite(s):** KORE 110 or appropriate placement score.

**Notes:** Students may not receive credit for KORE 210 and KORE 201 or 202.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**KORE 250 - Gateway to Advanced Korean**

Credits: 3 (NR)  
Develops advanced-intermediate level reading, writing, listening, and speaking skills through a comparative analysis of Korean cultural products and practices and a critical analysis of the influence of globalization and East Asian regional dynamics.

**Prerequisite(s):** KORE 210; appropriate placement score; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**Latin (LATN)**

Offered by the College of Humanities and Social Sciences  
Placement: See Academic Testing section of Admission chapter.

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**LATN 101 - Elementary Latin**

Credits: 3 (NR)  
Introduction including basic grammar, vocabulary, and development of reading skills, and introduction to Roman civilization.

**Notes:** Must be taken in sequence. Students may not receive credit for LATN 101 and LATN 109.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**LATN 102 - Elementary Latin**

Credits: 3 (NR)  
Introduction including basic grammar, vocabulary, and development of reading skills, and introduction to Roman civilization.

**Notes:** Must be taken in sequence. Students may not receive credit for LATN 102 and LATN 109.
LATN 109 - Intensive Elementary Latin

Credits: 6 (NR)
Recommended for students in minors of classical studies or Latin, and for students who want intensive introduction.

Notes: Students may not receive credit for LATN 109 and LATN 101 or 102.

LATN 201 - Intermediate Latin I

Credits: 3 (NR)
Intensive review of elementary grammar. Introduces more advanced grammatical constructions and patterns of usage, continued development of reading proficiency, and vocabulary and readings in Latin literature.

Prerequisite(s): LATN 102 or equivalent.

Notes: Students may not receive credit for LATN 201 and LATN 209.

LATN 202 - Intermediate Latin II

Credits: 3 (NR)
Study of advanced grammatical constructions, vocabulary, and patterns of usage. Reading of selections from Roman authors of late Republic and early Empire, and study of cultural and political backgrounds.

Prerequisite(s): LATN 201 or equivalent.

Notes: Students may not receive credit for LATN 202 and LATN 209.

LATN 209 - Intensive Intermediate Latin

Credits: 6 (NR)
Intensive Intermediate Latin.
Notes: Students may not receive credit for LATN 209 and LATN 201 or 202.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 2

LATN 351 - Roman Prose Literature

Credits: 3 (RD)
Introduces major work of prose, themes, and literary qualities. Emphasizes interpretation and stylistic analysis. Concentrates on one complete work; topics, authors vary.

Prerequisite(s): LATN 202 or equivalent.

Notes: Readings in Latin. May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LATN 352 - Roman Poetry

Credits: 3 (RD)
Introduces major work of poetry and themes, meters, and poetic techniques. Emphasizes interpretation, metrical and stylistic analysis, and poet's role in society. Topics and authors vary.

Prerequisite(s): LATN 202 or equivalent.

Notes: Readings in Latin. May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LATN 451 - Studies in Roman Literature

Credits: 3 (RD)
Focuses on a single Latin author or literary genre. Approaches subject from variety of interpretive perspectives, and uses secondary literature as well as primary texts. Topics and authors vary.

Prerequisite(s): LATN 351/352 or equivalent, or permission of instructor.

Notes: Readings in Latin. May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LATN 452 - Studies in Roman Literature
Credits: 3 (RD)
Focuses on a single Latin author or literary genre. Approaches subject from variety of interpretive perspectives, and uses secondary literature as well as primary texts. Topics and authors vary.

Prerequisite(s): LATN 351/352 or equivalent, or permission of instructor.

Notes: Readings in Latin. May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Latin American Studies (LAS)

Offered by the College of Humanities and Social Sciences

LAS 100 - Introduction to Latin American Studies

Credits: 1 (NR)
Weekly series of presentations by various Latin American Studies faculty. Short reading assignments and journal entries required.

Notes: Required for all Latin American studies majors.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit

LAS 490 - Internship

Credits: 1-6 (RD)
Approved work-study programs in cooperation with specific organizations including area museums, NGOs, and local, state and federal agencies.

Prerequisite(s): Latin American studies majors with permission of director.

Notes: Credit determined by program. May be repeated for a maximum of 9 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

LAS 491 - Directed Reading for Honors in Latin American Studies

Credits: 3 (NR)
Directed readings on specialized topic in Latin American Studies to prepare students for LAS 492, the honors research seminar in the major.
Prerequisite(s): admission to Latin American studies honors program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**LAS 498 - Study Abroad**

Credits: 1-6 (RD)
Study abroad.

Notes: May be repeated for a maximum of 6 credits with permission of department.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**LAS 499 - Research Seminar in Latin American Studies**

Credits: 3 (NR)
Research on specialized topic in Latin American Studies culminating in substantial paper and oral presentation. Students expected to integrate knowledge and skills acquired in general education courses.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

Prerequisite(s): 90 credits and complete or concurrent enrollment in all other required general education courses.

Notes: Must receive passing grade to graduate with a BA in Latin American studies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**Linguistics (LING)**

Offered by the College of Humanities and Social Sciences

**LING 306 - General Linguistics**

Credits: 3 (NR)

Fulfills general education requirement in social and behavioral science.
LING 307 - English Grammar

Credits: 3 (NR)
Overview of grammatical structure of English including word classes, phrases, and complex sentences. Analyzes English grammar using modern syntactic theory. Students engage in language description through problem solving.

Equivalent to ENGH 307, LING 322 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 450 - Introduction to Sociolinguistics

Credits: 3 (NR)
Overview of the study of language variation and change. Topics to be covered include the interaction between language and social factors (age, sex, social class), dialects of English, speech communities, language contact, and language and gender.

Prerequisite(s): LING 326.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 485 - Semantics and Pragmatics

Credits: 3 (NR)
Developments in theoretical linguistics that explore how language form is related to meaning and context. Topics include reference, lexical semantics, logic, quantification, truth conditions and sentential meaning, presuppositions, and speech acts.

Prerequisite(s): LING 326.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 486 - Syntax I

Credits: 3 (NR)
Nature and form of syntactic theory, and examination and analysis of the properties of several major natural language syntactic structures.
LING 490 - Generative Phonology

Credits: 3 (NR)
Sound systems of English and other languages from perspectives of phonological theory. Topics include articulatory phonetics, distinctive features, nature of phonological representations, rhythm and stress, and phonological universals and constraints.

Prerequisite(s): LING 326.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 499 - Independent Study

Credits: 1-3 (RD)
Intensive study of particular theoretical problem in linguistics conducted by student in close consultation with instructor. Student produces substantial piece of written work on research findings.

Prerequisite(s): LING 326 and 3 other LING credits, and permission of instructor.

Notes: May be repeated for a maximum of 6 credits with permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 507 - Field Work in Applied Linguistics

Credits: 3 (RD)
Field work providing working experience in language-teaching program or educational research organization.

Prerequisite(s): LING 326, 520, 521, or 582.

Notes: Contact the department one semester prior to enrollment. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 520 - Introduction to Linguistics
Credits: 3 (NR)
Introduces terminology and methodology of modern linguistic science, and detailed structural analysis of English phonology, morphology, and syntax.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 521 - Applied Linguistics: Teaching English as a Second Language

Credits: 3 (NR)
Theories and basic principles of teaching a second language, especially as they relate to English language. Introduces students to methods of teaching English to speakers of other languages.

Prerequisite(s): LING 520, 690, or 786.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 522 - Modern English Grammar

Credits: 3 (NR)
Overview of structure of modern English beginning with word classes and ending with analyses of complex sentences. Most topics introduced as problems of language description; in solving them, principles of syntactic argumentation are demonstrated. Students learn to tap intuitions about English to analyze grammatical structure.

Prerequisite(s): One course in linguistics, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 523 - English Phonetics

Credits: 3 (NR)
In-depth description and analysis of sound system processes of modern English. Topics include segmental phonetics, syllable structure, connected speech, and prosodic phenomena. Also addresses implications for language instruction.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 525 - Practicum in ESL

Credits: 3 (NR)
Involves preparation and presentation of lessons to adult English as second language (ESL) learners under guidance of mentor teacher and practicum professor. Field experience consists of observation and teaching in assigned ESL classroom.
Prerequisite(s): LING 521

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

LING 581 - Psycholinguistics

Credits: 3 (NR)
Study of mental and psychological aspects of human language, including aphasia, association, autism, language acquisition, verbal concept formation, and perception.

Prerequisite(s): LING 520, 690, or 786; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 582 - Second Language Acquisition

Credits: 3 (NR)
Examines second language (L2) acquisition from linguistic perspective. Compares first and second language acquisition. Explores factors contributing to L2 variation, including linguistic universals, transfer, age, input, and affective considerations.

Prerequisite(s): LING 520, 690, or 786; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 650 - Introduction to Sociolinguistics

Credits: 3 (NR)
An overview of the study of language variation and change. Topics to be covered include the interaction between language and social factors (age, sex, social class), dialects of English, speech communities, language contact, and language and gender.

Prerequisite(s): LING 520, 523, or 690.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 686 - Special Topics in Linguistics

Credits: 3 (NR)
Detailed advanced study of selected area of linguistics.
Prerequisite(s): Varies with topic.

Notes: Content varies. May be repeated once for credit with permission of department.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**LING 690 - Generative Phonology**

Credits: 3 (NR)  
Sound systems of English and other languages from the perspective of phonological theory. Topics include articulatory phonetics, distinctive features, nature of phonological representations and processes, rule ordering, abstractness, role of external evidence, and nonlinear phonology.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**LING 691 - Theories of Language**

Credits: 3 (NR)  
Seminar in linguistic metatheory. Examines wide range of theories about language and linguistic theory, including those of Saussure, Bloomfield, Chomsky, and others. Readings from original sources.

Prerequisite(s): LING 520, 690, or 786; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**LING 692 - Phonology II**

Credits: 3 (NR)  
Recent trends in phonological theory. Topics include stress assignment, tone spreading, and vowel harmony, from within nonlinear framework. Discusses segmental structure and underspecification.

Prerequisite(s): LING 690.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**LING 770 - Research Methods**

Credits: 3 (NR)  
Conceptualizing and conducting second language research, including process of developing research questions, gathering data,
obtaining permission from institutional review board, choosing data collection measures, and coding linguistic and nonlinguistic data.

**Prerequisite(s):** LING 582 and one of LING 690, 785, or 786; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**LING 782 - Second Language Acquisition II**

Credits: 3 (NR)  
Advanced course in second-language acquisition theory. Detailed analysis of internal and external constraints. Variation addressed from linguistic, psychological, and environmental perspectives.

**Prerequisite(s):** LING 582 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**LING 785 - Semantics and Pragmatics**

Credits: 3 (NR)  
Developments in theoretical linguistics that explore how language form relates to meaning and context. Topics include reference, lexical semantics, logic, quantification, truth conditions and sentential meaning, presuppositions, and speech acts.

**Prerequisite(s):** LING 520, 690, or 786; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**LING 786 - Syntax I**

Credits: 3 (NR)  
Nature and form of syntactic theory. Examines and analyzes properties of several major natural language syntactic structures.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**LING 787 - Syntax II**

Credits: 3 (NR)  
Theoretical treatment of syntactic phenomena that have emerged as standard problems for syntactic analysis. Problems include binding, extraction, and quantification. Extensive reading in primary theoretical literature.
Prerequisite(s): LING 786.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 788 - Semantics and Pragmatics II

Credits: 3 (NR)
Advanced course in semantic and pragmatic theory. Study of meaning under truth-conditional, model-theoretic framework explored and related to syntax and pragmatics.

Prerequisite(s): LING 785 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 798 - Directed Reading and Research

Credits: 1-3 (RD)
Reading, research, and writing on specific project under direction of departmental member.

Prerequisite(s): 18 credits of linguistics courses.

Notes: Open only to students who have completed at least 18 credits of LING courses. Prior approval by faculty member required. Written report required. May be repeated for a maximum of 6 credits with permission of director.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Graduate Special

LING 799 - Thesis

Credits: 1-6 (RD)
Students who take LING 798 to develop thesis topic and then elect thesis option receive 3 credits after completing thesis. Students who do not take LING 798, or who take it to work on project unrelated to thesis, receive up to 6 credits after completing thesis.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

LING 882 - Seminar in Language Acquisition
Advanced topics seminar in current language acquisition theory.

Prerequisite(s): LING 782 or permission of instructor.

Notes: Topics vary. May be repeated for a maximum of 9 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 886 - Advanced Syntax Seminar

Credits: 3 (RT)
Advanced course in current syntactic theory.

Prerequisite(s): LING 786, LING 787, or permission of instructor.

Notes: Topics vary. May be repeated for a maximum of 9 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 890 - Advanced Phonology Seminar

Credits: 3 (RT)
Advanced topics seminar in current phonological theory.

Prerequisite(s): LING 692 or permission of instructor.

Notes: Topics vary. May be repeated for a maximum of 9 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 897 - Independent study

Credits: 3 (RD)
Independent reading on a topic agreed on by student and faculty member.

Prerequisite(s): PhD rank or permission of instructor.

Notes: May be repeated

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
LING 898 - Advanced Qualifying Seminar

Credits: 3 (RT)
Work on PhD qualifying paper.

Prerequisite(s): Completion of 33 credits of core courses in linguistics.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

LING 998 - Doctoral Dissertation Proposal

Credits: 1-6 (RD)
Work on research proposal that forms basis for the doctoral dissertation.

Prerequisite(s): Advancement to candidacy.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NC

LING 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral dissertation research and writing under direction of student's dissertation committee.

Prerequisite(s): Completion of LING 998.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NC

Management (MGMT)

Offered by the School of Management

If a student takes noncore, upper-level business courses before admission to SOM, those courses will not count on an undergraduate degree application for any major in the school, except as general elective credit. A grade of C or higher must be presented on the graduation application for each upper-level course in the major. Course prerequisites are strictly enforced. Degree status is defined as formal admission to BS degree status in SOM.

MGMT 301 - People and Organizations
Explores how individuals behave in the workplace, and how group and organizational structures affect behavior. Builds managerial skills required for working with and through others to reach organizational goals. Topics include individual differences, groups and teams, managing conflict, organizational ethics, culture, diversity, influence, leadership, and motivational theories and techniques. The course format provides opportunities to discuss and apply concepts. School of Management students will not be permitted to make more than three attempts to achieve a C or higher in MGMT 301. Those who do not successfully complete this course within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

**Prerequisite(s):** Sophomore standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

### MGMT 312 - Principles and Practices of Management

Credits: 3 (NR)  
Builds on fundamental theories and concepts learned in MGMT 301 by examining the nature of managerial work under a range of business models and under rapidly changing business conditions. Managerial functions and activities such as planning, strategizing, organizing, controlling, and directing are examined in depth and in the context of current organizational examples and scenarios.

**Prerequisite(s):** C or higher in MGMT 301 and degree status. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

### MGMT 321 - Introduction to Human Resource Management

Credits: 3 (NR)  
The field of human resource management examines what can or should be done to make workers more productive and satisfied. The course builds on MGMT 301 by introducing key concepts and techniques that managers need to attract, retain, develop, compensate, and motivate quality talent. Also emphasizes legal and ethical considerations in human resource management.

**Prerequisite(s):** C or higher in MGMT 301 and degree status. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

### MGMT 412 - Diversity in Organizations
Credits: 3 (NR)
Builds on MGMT 301 by emphasizing intrapersonal, interpersonal, organizational, and societal phenomena relevant to issues of diversity. Examines phenomena and processes in general and with regard to specific dimensions such as gender, race, and ability. Designed to increase students' knowledge of diversity in organizations, understanding of others' perspectives, and ability to work well with people who differ from themselves.

Prerequisite(s): C or higher in MGMT 301 and degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MGMT 413 - Organizational Development and Management Consulting

Credits: 3 (NR)
Introduces theory and practice of organization development. Assumes some basic knowledge of organizational behavior, and addresses how to use knowledge about organizations to change them. Focuses on ways of understanding organizations with attention to theoretical underpinnings of field and diagnostic models, and processes for entering organizations. Later sessions focus on contracting, data collection, organizational diagnosis, data feedback, and change technologies.

Prerequisite(s): C or higher in MGMT 301; degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MGMT 421 - Advanced Human Resource Management

Credits: 3 (NR)
Builds on MGMT 321 by using a case-based approach to deepen understanding of HRM practices. Students conduct projects requiring application of strategic HR processes. Includes discussion of advanced topics not thoroughly covered in MGMT 321. Relevant for management majors, particularly those seeking a human resource management career. Helps prepare for SHRM Professional in Human Resources certification exam.

Prerequisite(s): C or higher in MGMT 301 and 321, and degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MGMT 431 - The Legal Environment for Employee and Labor Relations

Credits: 3 (NR)
Examines the legal aspects of employee and labor relations from a managerial perspective. Topics include the employment at will doctrine; wrongful discharge; federal and state employment discrimination legislation; and regulation of employee welfare. Includes lectures, cases, readings.
Prerequisite(s): C or higher in MGMT 321 and BULE 302; degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring

MGMT 451 - New Venture Creation

Credits: 3 (NR)  
Explains process of conceptualizing and creating new venture. Using central concepts of innovation, strategic opportunities, and globalization, students learn to evaluate new venture opportunities and consider external environment's impact. Students gain greater understanding of entrepreneurial concepts by developing business plans that address critical issues, including management composition and structure, effective business and functional strategies, operational logistics, legal issues, financial projections, and financing options.

Prerequisite(s): C or higher in MGMT 301 and degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring

MGMT 461 - Cross Cultural and Global Management

Credits: 3 (NR)  
Explores theory and practice of managing culturally diverse organizations in domestic and international contexts. Topics include management customs and practices in different world regions, cross-cultural communication and learning, and the developing culturally and internationally sophisticated employees and managers.

Prerequisite(s): C or higher in MGMT 301, and degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall, Spring

MGMT 462 - Honors Seminar in Management

Credits: 3 (NR)  
Topic and format vary. In-depth study of topic of interest to managers and organizations.

Prerequisite(s): Invitation by professor.

Notes: Enrollment limited and competitive.

Hours of Lecture or Seminar per week: 3
MGMT 463 - Negotiations in Organizations

Credits: 3 (NR)
Focuses on theory, processes, and practice of negotiation within and across organizations, including attention to ethical issues. Explores systematic ways to increase quality of negotiated agreements, including methods of preparation and use of rational assumption, bidding and decision criteria. Format includes negotiation exercises, lecture, and discussion.

Prerequisite(s): C or higher in MGMT 301 and degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MGMT 464 - Teamwork and Interpersonal Skills

Credits: 3 (NR)
Focuses on intensive development of high professional-level skill set for collaboration and leadership in contemporary environments. Builds on content introduced in MGMT 301, 312. Attention to developing personal leadership capabilities, collaborating in traditional and virtual environments, improving group processes, project management, tolerating ambiguity, improving communication, creative problem solving, time management, coaching, and empowering employees.

Prerequisite(s): C or higher in MGMT 301 and degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MGMT 471 - Competitive Strategy

Credits: 3 (NR)
Explores industry structures and competitive behavior of firms. Attention to how firm uses tangible, intangible, and human resources to develop sustainable competitive advantage, and how competitors interact in marketplace. Introduces tools and concepts to analyze industry dynamics and competitive interactions of firms in these industries.

Prerequisite(s): C or higher in MGMT 301 and degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MGMT 491 - Current Topics in Management
Advanced study of management concepts and selected topics. Incorporates intensive analysis of management problems of long-term strategic significance or current urgency for organizational planning and operations. Includes significant contemporary research findings.

Prerequisite(s): C or higher in MGMT 312; degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MGMT 499 - Independent Study

Credits: 1-3 (RT)
Research and analysis of selected problems or topics in management must be arranged with instructor and approved in writing by associate dean for undergraduate programs.

Prerequisite(s): Management majors with at least 9 upper-level management credit hours.

Notes: Written report required.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

Management Information Systems (MIS)

Offered by the School of Management

If a student takes noncore, upper-level business courses before admission to SOM, those courses will not count on an undergraduate degree application for any major in the school, except as general elective credit. A grade of C or higher must be presented on the graduation application for each upper-level course in the major. Course prerequisites are strictly enforced. Degree status is defined as formal admission to BS degree status in SOM.

MIS 102 - Spreadsheet Applications for Business

Credits: 1 (NR)
Hands-on course using popular spreadsheet package. Business examples used to teach fundamentals of spreadsheets and their use in business applications.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 1
Grading: S/NC
When Offered: Fall, Spring, Summer

MIS 301 - Introduction to Business Information Systems
Introduces fundamentals of hardware, software, and networking. Emphasizes role of technology in improving contemporary business processes and competitive advantage. Includes basic relational concepts, hands-on experience in building business database applications and decision support using spreadsheet software.

School of Management students will not be permitted to make more than three attempts to achieve a C or higher in MIS 301. Those who do not successfully complete this course within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies

Prerequisite(s): Sophomore standing.

Notes: Projects required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MIS 302 - Introduction to Programming for Business Applications

Credits: 3 (NR)
Covers design and implementation of program data structures and algorithms to solve business problems using structured programming techniques. Students become familiar with program development life cycle using standard programming language such as Visual BASIC.NET supported by a modern Integrated Development Environment (IDE). Students complete assignments involving development of real-life business application.

Prerequisite(s): Degree status.

Notes: IT 108 highly recommended but not required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MIS 310 - Database Management Systems

Credits: 3 (NR)
Introduces principles of designing and manipulating relational databases with a focus on business applications. Theoretical database concepts and hands-on experience with a relational package. Term project requiring implementation of a substantial business database application.

Prerequisite(s): C or higher in MIS 301, degree status. Prerequisite enforced by registration system.

Notes: SOM majors may not receive credit for both MIS 310 and IT 214. Requires hands-on implementation using software package.

Hours of Lecture or Seminar per week: 3
MIS 320 - Networks and Security

Credits: 3 (NR)
Introduces students to fundamentals of networking technologies and their role in businesses. Emphasis is on understanding the business implications of different networking technologies and solutions. Students learn to identify and understand the business requirements, and bring together the different technological components to design the required communication solutions. Also focuses on the types of security threats to the business network infrastructure, and approach to tackling such threats through business practices combined with appropriate technological solutions.

Prerequisite(s): C or higher in MIS 301, degree status. Prerequisite enforced by registration system.

Notes: The course also includes lab work and exercises.

MIS 330 - Systems Analysis and Design

Credits: 3 (NR)
Understanding systems analysis and design methods is a necessary skill for contemporary business analysts, managers, software engineers and system users. Provides students with the foundations for effectively using modern systems analysis and design tools and methodologies for developing modern software and applications. Topics include systems planning and feasibility analysis, requirements analysis, economics, systems design and project management.

Prerequisite(s): C or higher in MIS 310, degree status. Programming course recommended. Prerequisite enforced by registration system.

Notes: Requires team project.

MIS 411 - Management and Control of Information Systems

Credits: 3 (NR)
Managerial perspective on issues arising in managing information systems through their life-cycle. The topics include using different methodologies for estimating software development costs, maintenance costs, systems project management, and pricing information products and services. The course also covers methodologies for monitoring performance of information systems, and ways for assessing the strategic and business value of use of information technology.

Prerequisite(s): C or higher in MIS 301, degree status. Prerequisite enforced by registration system.
MIS 412 - E-Business Systems Development

Credits: 3 (NR)
Introduces students to the development of web-based information systems for E-business. Students learn to develop web-based database applications for eCommerce using ASP.NET. Also covers Web 2.0 technologies and contemporary business trends and issues related to web application development. Emphasizes technologies, methods, and application development tools.

Prerequisite(s): C or higher in MIS 301, degree status. Prerequisite enforced by registration system.

Notes: Requires team project and computer lab.

MIS 430 - Data Warehousing and Data Mining

Credits: 3 (NR)
Deals with the challenges faced by businesses in managing large amounts of data and making meaningful use of this data for informed decision making. Introduces students to data warehousing fundamentals, practices, and technologies; and their application to solving business problems. Specific emphasis is on designing of data warehouse to meet the business requirements and hands-on learning of the design principles through implementation on commercially used data warehouse technologies. Also introduces students to OLAP solutions and data mining approaches to supporting business decision making.

Prerequisite(s): C or higher in MIS 310, degree status. Prerequisite enforced by registration system.

Notes: Term project required.

MIS 435 - Knowledge Management

Credits: 3 (NR)
Focuses on new trends on how knowledge management works for organizations, best strategy for such transition, and what are knowledge management elements.

Prerequisite(s): C or higher in MIS 310, degree status. Prerequisite enforced by registration system.
MIS 440 - E-Commerce Business Models and Applications

Credits: 3 (NR)
Introduces students to business models used in E-commerce and E-business. Covers B2B, B2C, and C2C business models and also introduces current business trends of the Web 2.0 era and the core concepts of the information economy, networked business models, and the social web. The class will discuss Blogging, Wikis, Social Networks, Information Goods, and E-Tailing. Students complete a group project in which they create a business plan for a viable Internet-based business.

Prerequisite(s): C or higher in MIS 310, degree status. Prerequisite enforced by registration system.

Notes: Requires a term project.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MIS 462 - Honors Seminar in Management Information Systems

Credits: 3 (NR)
Topic and format vary. In-depth study of a topic in the area of information technology management. Enrollment limited and competitive.

Prerequisite(s): Senior standing, ISOM (or DMIS) major, senior standing; permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MIS 491 - Seminar in Management Information Systems

Credits: 3 (RT)
Analyzes selected topics that highlight latest developments in information resource management field, including contemporary research findings and case studies of information systems in business and other organizations.

Prerequisite(s): C or higher MIS 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MIS 499 - Independent Study in Management Information Systems

Credits: 1-3 (RT)
Research and analysis of selected problems or topics in information resource management.
Prerequisite(s): C or higher in MIS 301; degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Management of Secure Information Systems (MSEC)

MSEC 510 - Foundations of Cyber Security

Credits: 2 (NR)
Provides an overview of the introductory topics in cyber security, which will be the basis for the other security-related in the MSIS. Topics include basic concepts on CIA (confidentiality, integrity, and availability), risk management, disaster recovery, access control, basic cryptography and software application vulnerabilities.

Prerequisite(s): Admission to the Executive MS in Management of Secure Information Systems.

Notes: 4 class sessions will be 3.5 hours long.
1 class session will be 2 hours and 20 minutes long.
(5 classes; 16 hours and 20 minutes total)

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSEC 511 - Security Practices in the Enterprise

Credits: 2 (NR)
Provides the practices and methods currently used by information security professionals to manage and operate the secure IT infrastructures in the enterprise industry and in the US Federal Sector. It covers tools and knowledge required to design, execute, and/or evaluate the INFOSEC standards and procedures required of government and industry. The topic includes security operation center (SOC), network security, malware countermeasures, operational systems security, risk analysis and incident response practices.

Prerequisite(s): MSEC 510.

Notes: 4 class sessions will be 3.5 hours long.
1 class session will be 2 hours and 20 minutes long.
(5 classes; 16 hours and 20 minutes total)

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer
MSEC 520 - Networking Principles

Credits: 1 (NR)
Introduction to the principles guiding the design and operation of modern communication networks; using the structure provided by layered service models, this course explores systematically the architecture and protocols of large, decentralized networks. Topics include medium access control in local area networks, switching, routing, and addressing, reliable and secure transport, flow and congestion control. Throughout, examples are drawn from the suite of Internet protocols.

Prerequisite(s): Admission to the Executive MS in Management of Secure Information Systems.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall

MSEC 620 - Networking Security

Credits: 2 (NR)
Provides a comprehensive introduction to network security concepts and problems and the mechanisms and tools to secure networks. Focuses on the Internet; discusses the threats to and from the Internet and examines existing Internet security techniques and protocols and their limitations. Topics include secret key and public key cryptography, Hash algorithms, authentication, IPSEC/VPN, IPSEC key exchange, SSL/TLS, firewall, anonymous communication, and VoIP security.

Prerequisite(s): MSEC 510 and 520.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MSEC 630 - Secure Information System Governance, Regulation, and Compliance

Credits: 2 (NR)
Provides insight into secure information system governance, regulations, and compliance including noteworthy legislation, regulations, and compliance issues as well as commonalities and significant differences between departments and agencies within the Federal Executive Branch (FEB). The course is presented as formal lectures complemented by group discussion. Each topic is addressed as part of the larger Secure Information System structure.

Prerequisite(s): MSEC 510

Notes: 4 class sessions will be 3.5 hours long.
1 class session will be 2 hours and 20 minutes.
(5 total class sessions; 16 hours and 20 minutes total).

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSEC 640 - Privacy and Ethics in an Interconnected World
Credits: 2 (NR)
Course considers key ethical issues for professionals in network security in an emerging age of internet access, virtual environments, and wireless capabilities. Intellectual property, privacy, computer abuse, free speech, and commerce are examined.

Prerequisite(s): Admission to the Executive MS in Management of Secure Information Systems program.

Notes: 4 class sessions will be 3.5 hours long.
1 class session will be 2 hours and 20 minutes long.
(5 class sessions; 16 hours 20 minutes total)

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSEC 641 - Enterprise Security Threats

Credits: 1 (NR)
Provides a broad exposition of emerging cyber-security threats for large-scale enterprises: Denial of Service (DoS), insider attacks, remote exploitation. It covers defenses that may mitigate or curtail some aspects of these emerging security threats.

Prerequisite(s): MSEC 511.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSEC 642 - Enterprise Security Technologies

Credits: 2 (NR)
Provides an overview of enterprise security tools used in advanced security IT departments of enterprises today. In addition to understanding the tools, their capabilities, and their gaps, students participate in hands-on laboratory exercises with enterprise security tools.

Prerequisite(s): MSEC 511.

Notes: 4 class sessions will be 3.5 hours long.
1 class session will be 2 hours and 20 minutes long.
(5 class sessions; 16 hours 20 minutes total)

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

MSEC 650 - Seminar: Enterprise Security Case Studies

Credits: 1 (NR)
Provides an exposition of large enterprise security systems including operational requirements, threat model, security analysis, economic analysis, and defense posture options that expose the operational and economic trade-offs when architecting Enterprise
security.

Prerequisite(s): MSEC 641.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MSEC 710 - Global Residency

Credits: 1-4 (RD)
Students spend a week in an international residency. Emphasis is on how other nations deal with management of secure information system, the management of those systems, and related public policy issues. Corporate site visits are combined with presentations by professors from universities outside the United States and relevant practitioners. Students are required to write a paper summarizing their observations and attend pre-residency preparatory sessions.

Equivalent to TECM 757

Prerequisite(s): Admission to Executive MS in Management of Secure Information Systems.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MSEC 720 - Capstone Project in Management of Secure Information Systems

Credits: 1-3 (RD)
Teams undertake a strategic evaluation and plan for the management of secure information systems. They develop plans that include technical, organizational, and policy aspects. A report is produced and presented to the entire cohort for discussion.

Equivalent to TECM 737

Prerequisite(s): Admission to Executive MS in Management of Secure Information Systems.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
When Offered: Fall, Spring, Summer

Marketing (MKTG)

Offered by the School of Management

If a student takes noncore, upper-level business courses before admission to SOM, those courses will not count on an undergraduate degree application for any major in the school, except as general elective credit. A grade of C or higher must be presented on the graduation application for each upper-level course in the major. Course prerequisites are strictly enforced. Degree status is defined as formal admission to BS degree status in SOM.
MKTG 301 - Principles of Marketing

Credits: 3 (NR)

Examines marketing principles and practices for analyzing, creating, delivering, capturing, and communicating value to customers. Focuses on managing customer relationships using market-driven strategies, particularly segmentation, targeting, and positioning. The role of customer satisfaction in achieving organizational objectives and ethical decision making in a global economy are also emphasized.

School of Management students will not be permitted to make more than three attempts to achieve a C or higher in MKTG 301. Those who do not successfully complete this course within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the “Termination from the Major” section under Academic Policies.

Prerequisite(s): Sophomore standing, C or better in ACCT 203 and ECON 103.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MKTG 311 - Sales Management

Credits: 3 (NR)

Familiarizes students with marketing-sales interfaces including sales force role and capabilities, personal selling strategies, organizational relationships, and responsibilities of sales managers including training, motivating, and evaluating sales force.

Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MKTG 312 - Consumer Behavior

Credits: 3 (NR)

Marketing strategy implications of internal and external influences on consumer decision making, purchase, and consumption behaviors. Emphasizes demographics, lifestyle, situation, perception, learning, and attitude formation and change, focusing on customer segmentation, satisfaction and loyalty.

Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
MKTG 313 - Integrated Marketing Communications

Credits: 3 (NR)
Examines development of integrated communications programs, including advertising, sales promotion, public relations, direct marketing, and other communication tools. Focuses on setting communications objectives and budgets, media planning, creative strategy, execution, and evaluation. Provides skills for analyzing the strengths, weaknesses and synergies of marketing communication tools.

Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MKTG 315 - Internet Marketing

Credits: 3 (NR)
Explores impact of Internet technology on marketing strategy and practice. Topics include online advertising campaigns (focusing on search marketing), web site usability and content, and the use of social and interactive media to build customer relationships and foster brand loyalty.

Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MKTG 332 - Retailing and E-Commerce Management

Credits: 3 (NR)
Examination of retailing as a specialized economic and social institution within the distribution process and as it relates to overall marketing activities. The planning and implementing of store and nonstore (catalog, Internet) retail marketing strategies are addressed. Critical decision alternatives, variables, forces, and processes are considered from a managerial perspective

Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MKTG 333 - Business to Business Marketing

Credits: 3 (NR)
Examines unique challenges and opportunities of marketing systems among suppliers, manufacturers, resellers, and government. Focuses on developing a capability to identify and nurture long-term B2B relationships. Provides tools and techniques commonly leveraged by B2B marketers to develop these relationships with their clients.
Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring, Summer

MKTG 351 - Marketing Research Techniques and Applications

Credits: 3 (NR)
Presents the concepts and techniques underlying the marketing research process and their role in managerial decision making. Focuses on skills required to conduct a marketing research project: qualitative and quantitative research designs, survey methodology, instrument creation, sampling procedures, data collection, data analysis, and reporting of findings.

Prerequisite(s): C or higher in OM 210 and MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MKTG 407 - International Marketing

Credits: 3 (NR)
Multidisciplinary approach to international marketing from viewpoint of business management. Examines major marketing issues affecting companies operating in a global environment. Students achieve understanding of economic, political, and cultural differences among nations as they affect marketing opportunities and operations, and develop skills to identify and evaluate international marketing opportunities.

Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MKTG 451 - Competitive Intelligence and Information Security

Credits: 3 (NR)
Develops understanding of benefits to commerce and society because of Internet-based commerce, escalating threats against Internet-based marketing initiatives, and protection of knowledge-based assets of firms.

Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
MKTG 455 - Ethnic and Multicultural Marketing

Credits: 3 (NR)
Ethnic and Multicultural Marketing examines the critical marketing issues and opportunities that have arisen with the changing U.S. demographics. The focus is domestic markets. The growth in minority populations indicates a need for specialized approaches for the entire marketing mix. Segmentation can be powerful when considering non-mainstream markets if the marketer understands and capitalizes on the different approaches cultural and ethnic groups use as consumers.

Prerequisite(s): "C" or higher in MKTG 301; Degree Status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MKTG 462 - Honors Seminar in Marketing

Credits: 3 (NR)
Topic and format vary. In-depth study of topic of interest to managers and organizations.

Prerequisite(s): Degree status in MKTG major; senior standing; permission of department.

Notes: Enrollment limited and competitive.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MKTG 471 - Marketing Management

Credits: 3 (NR)
Emphasizes managerial aspects of marketing, including developing marketing strategies and plans, and integrating specific elements of marketing process. Emphasizes case analysis.

Prerequisite(s): Senior standing; C or higher in MKTG 312 and 351; degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MKTG 481 - Marketing in the Nonprofit Sector

Credits: 3 (NR)
Examines the unique challenges of applying marketing principles and practices to not-for-profit groups such as human service and philanthropic organizations, museums, health and wellness advocates, educational institutions, industry associations and government. Emphasis on case studies, team work, and projects.

Prerequisite(s): C or higher in MKTG 301, degree status. Prerequisite enforced by registration system.
MKTG 491 - Special Topics in Marketing

Credits: 3 (RT)
In-depth treatment in seminar format of contemporary topics in marketing. Culminates in preparation of substantial paper and oral presentation.

Prerequisite(s): C or higher in MKTG 301, 9 credits of marketing, degree status. Prerequisite enforced by registration system.

MKTG 499 - Independent Study

Credits: 1-3 (RT)
Primary research proposal in marketing area. Requires prior approval from instructor and associate dean for undergraduate programs.

Prerequisite(s): 90 credits (senior class standing) and a minimum of 24 credits of business courses, including principles of marketing, finance, and management.

Master of Business Administration (MBA)

Offered by the School of Management

MBA 603 - Managerial Economics and Decisions of the Firm

Credits: 3 (NR)
Provides fundamental understanding of applying microeconomics concepts to managerial decision making. Explores principles of microeconomic theory, including market supply and demand, production and cost functions, industry structure, and product and resource pricing.

Prerequisite(s): Admission to the MBA or MSA program or permission of the program director.
MBA 612 - Managing Costs and Evaluating Performance

Credits: 1.5 (NR)
Examines impact of cost and cost allocation on performance and evaluation.

Prerequisite(s): Admission to the MBA or MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring, Summer

MBA 613 - Financial Reporting and Decision Making

Credits: 3 (NR)
Foundation course focusing on economics and analysis of business transactions and related financial reporting issues. Topics include introduction to accounting framework used in financial reporting; and analysis of financial statements, economic events and their impact on financial reports, and impact of accounting methods on financial reports.

Prerequisite(s): Admission to MBA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MBA 623 - Marketing Management

Credits: 3 (NR)
Develops market-based knowledge and skills for effective marketing decision making, strategy design, implementation, and evaluation in wide variety of institutional and competitive situations. Addresses the importance of companies being market-driven and customer-focused.

Emphasis on case studies, team work, and projects.

Prerequisite(s): Admission to MBA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MBA 633 - Statistics for Business Decision Making

Credits: 3 (NR)
Uses statistical methods as analytical tools for understanding and solving business problems and supporting business decision making. Includes descriptive statistics, sampling, inferencing and regression. Extensive use of applied business scenarios to illustrate concepts and computer software for data analysis.
Prerequisite(s): Admission to the MBA or MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MBA 638 - Operations Management

Credits: 3 (NR)
Focuses on design, planning, and control activities to produce and deliver goods and services in modern organizations. Introduces wide range of operations management decisions, such as operations strategy, process analysis and design, capacity planning, supply chain management, total quality management, and project management. Uses quantitative modeling, case studies, and computer software to analyze and solve operations management problems.

Prerequisite(s): Admission to MBA or MSA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MBA 643 - Managerial Finance

Credits: 3 (NR)
Introduces theory and practice of finance within corporations. Topics include intertemporal choice, valuation, capital budgeting and structure, working capital management, and risk and return analysis.

Prerequisite(s): Admission to the MBA or MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MBA 653 - Organizational Behavior

Credits: 3 (NR)
Emphasizes development of conceptual tools for understanding and analyzing individual and group behavior in organizations and organizational processes. Considerable focus on developing relevant skills for working in groups and teams. Lectures, discussions, case analyses, and class exercises.

Prerequisite(s): Admission to MBA or MSA program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
MBA 662 - Management of Information Technology

Credits: 1.5 (NR)
The strategic, economic and managerial aspects of managing an organization's IT assets are covered. The business value of IT is understood and assessed in context of its impact on the organization's structure and strategy. The course includes discussion on major issues pertaining management of IT infrastructure.

Prerequisite(s): Admission to the MBA or MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring, Summer

MBA 673 - Legal Environment for Management

Credits: 1.5 (NR)
Examines the managerial impact of the law upon decision-making processes in business organizations. Lectures as well as discussions of judicial opinions and readings.

Prerequisite(s): Admission to MBA program or MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring, Summer

MBA 674 - Ethical and Social Environment of Business in the 21st Century

Credits: 1.5 (NR)
Strengthens the student's ability to identify, critically analyze, appropriately respond to, and provide leadership regarding the issues of ethical and socially responsible behavior which they may confront as employees and eventually as managers of people, objects, and organizations.

Prerequisite(s): Admission to the MBA or MSA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring, Summer

MBA 678 - Strategy and Organizational Leadership

Credits: 3 (NR)
Capstone course focusing on strategy development at business unit and corporate level. Cases, readings, and project format familiarize students with strategic management function and help them develop analytical, organizational, and managerial skills to analyze complex business situations. Provides opportunities to integrate knowledge gained in prior course work.

Prerequisite(s): Admission to MBA program.
MBA 701 - Business Analysis and Valuation

Credits: 3 (NR)
Develops framework for business analysis and valuation using financial statement data. Analyzes management decisions such as equity valuation, creditworthiness, merger valuation, corporate financial structure, and management communication strategy.

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

MBA 702 - Corporate Financial Policy

Credits: 3 (NR)
Applies theories and methods of corporate financial management to series of complex cases. Topics include capital projects as real options, cost of capital and capital structure, firm valuation, project finance, and merger and acquisition analysis.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

MBA 703 - Financial Markets

Credits: 3 (NR)
Explores relationship among financial markets including global equity markets, U.S. Treasury securities, and exchange-traded and over-the-counter financial derivative instruments such as futures, options, swaps, and asset-backed securities.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

MBA 704 - Risk Management and Financial Innovation
Credits: 3 (NR)
Considers how to identify, measure, and manage financial risk using innovative financial instruments and diversification strategies. Focuses on derivatives as tools in risk-management plans.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 705 - Venture Capital and Private Finance

Credits: 3 (NR)
Considers market microstructure of venture capital and private finance: costs and benefits from employing private financing, interaction between the financiers and entrepreneurs, financial analysis of potential ventures, and investor exit strategies.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MBA 706 - Investment Analysis

Credits: 3 (NR)
Focuses on analyzing equity securities and debt instruments given implications of efficient market hypothesis and modern capital market theory.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MBA 708 - Taxes and Business

Credits: 3 (NR)
Provides framework for making managerial decisions in global tax environment. Examines business decisions such as location of facilities, employee compensation, mergers and acquisitions, capital and asset structure, and business form.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
MBA 711 - Entrepreneurship

Credits: 3 (NR)
Considers fundamental aspects of entrepreneurship and process of new venture creation. Draws on broad range of business disciplines including management, marketing, finance, and accounting to develop evaluation and execution skills.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 712 - Project Management

Credits: 3 (NR)
Focuses on designing, planning, monitoring, and controlling projects. Involves practical examination of how projects should be managed from start to finish, including specific emphasis on how to avoid common pitfalls. Includes hands-on experience with a common project management software package.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 713 - Human Resource Management

Credits: 3 (NR)
Strategic human resource functions from both a general manager and HR perspective. Students become acquainted with current talent management matters facing organizations in today's business environment and are challenged to generate and debate creative solutions to prevalent issues. Topics include hiring, firing, rewarding, compensating, managing performance, career development, global HR issues, and workplace security.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MBA 714 - Managing Growth of Small Businesses

Credits: 3 (NR)
Focuses on unique challenges faced by small and entrepreneurial firms that seek long-term growth. Builds on concepts and knowledge of creating start-up company, and introduces processes and strategies required to become significant player in industry segment. Designed for students interested in understanding opportunities and problems in their own businesses, employment in small or entrepreneurial businesses, or exploring corporate entrepreneurship within large firms.
Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**MBA 715 - Advanced Project and Program Management**

Credits: 3 (NR)
Examines advanced topics in project and program management with specific attention to issues and skills that managers needs to effectively manage multiple projects and programs. Topics include project selection, multiple project resource allocation, and organization of project office.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**MBA 716 - International Business Strategy**

Credits: 3 (NR)
Focuses on the globalization of business activities, the strategic challenges faced by companies in global competition, and how companies strategically respond to these new competitive challenges.

Prerequisite(s): Completion of MBA core requirements

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer

**MBA 717 - International Finance**

Credits: 3 (NR)
Advanced analysis of managing firm's international financial operations. Topics include currency risk, political risk, returns and funding of international projects, international markets and accounting, and cost of capital. Lecture, discussion, readings, and cases.

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer
MBA 718 - International Marketing

Credits: 3 (NR)
Addresses marketing process for products and services within major international markets. Topics include marketing mix strategies using standardization, localization, or globalization approaches. Emphasizes the introduction of service innovations and new products in the global market.

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MBA 719 - Entrepreneurship Laboratory

Credits: 1.5 (RT)
Permits MBA students to work with entrepreneurial community to gain first-hand knowledge of process of soliciting second-stage funding for new businesses, evaluating applications for second-stage funding, consulting for entities seeking funding, and negotiations for obtaining second-stage funding.

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Notes: May be repeated three times in same semester.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1.5
When Offered: Fall, Spring, Summer

MBA 721 - Marketing Decision Systems

Credits: 3 (NR)
Develops skills to plan and implement effective marketing research studies. Topics include research design, data collection, statistical analysis, and use of database systems. Offers perspective on how managers can use market data to develop successful product or service strategies.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 722 - Consumer Behavior

Credits: 3 (NR)
An integrated analysis of internal and external influences on consumer decision making, purchase, and consumption behaviors with attention to marketing strategy implications. Emphasizes demographics, lifestyle, situation, perception, learning, and attitude
formation and change, focusing on customer segmentation, satisfaction, loyalty, and product-person relationships.

**Prerequisite(s):** Completion of MBA core requirements, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**MBA 723 - Supply Chain Management**

Credits: 3 (NR)  
Examines logistics of supply chain systems, including inventory management, distribution channels, and information systems. Emphasizes strategic alliances and international issues.

**Prerequisite(s):** Completion of MBA core requirements, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**MBA 724 - Marketing Communications**

Credits: 3 (NR)  
Examines all forms of communication and sources of brand or company contacts as potential message channels in building relationship with customers. Focuses on integrated planning process for all communication elements, including consumer and trade advertising, public relations, direct and database marketing, promotions, and sales presentations to achieve synergy in communicating with various constituencies.

**Prerequisite(s):** Completion of MBA core requirements, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**MBA 725 - Leadership**

Credits: 3 (NR)  
Overview of major conceptualizations of leadership and motivation in organizations. Integrates theory, research, and applications. Students apply principles of leadership and motivation to their own work situations and case evaluation.

**Prerequisite(s):** Completion of MBA core requirements, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring
MBA 726 - Negotiations

Credits: 3 (NR)
Focuses on theory, processes, and practice of negotiation within and across organizations, including attention to ethical issues.
Explores systematic ways to increase quality of negotiated agreements, including methods of preparation, effective communication, and various strategies to increase power. Format includes negotiation exercises, lecture, and discussion.

Prerequisite(s): Completion of MBA core.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 730 - Management of Technology and Innovation Processes

Credits: 3 (NR)
Students will develop a strong conceptual foundation for managing technological innovation. It introduces frameworks for analyzing how firms can create, commercialize and capture value from products and services. Topics covered comprise the formulation of innovation strategies, the process of developing new products and services, and how to create and manage an innovative organization to drive revenue growth.

Prerequisite(s): Admission to the MBA program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MBA 731 - Business Application and Life Cycle Management

Credits: 3 (NR)
Studies methods and tools for analyzing and designing business information systems with emphasis on business processes.
Topics include data modeling, process modeling, interaction analysis, and user interface.

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 732 - Knowledge Management

Credits: 3 (NR)
Examines firms that use knowledge management principles and approaches: intellectual capital, human capital, customer capital, tacit and explicit knowledge, new role of chief knowledge officer, leveraging of knowledge management.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.
MBA 733 - Business Data Communications

Credits: 3 (NR)
Introduces data communications and telecommunications technologies and application in business, including LANs, WANs, PBXs, voice services, network operating systems, corporate internetworking, and Internet. Analyzes data communications industry, and business applications in manufacturing and service sectors, along with regulatory issues and impact of globalization.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

MBA 734 - Electronic Commerce and E-Business

Credits: 3 (NR)

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

MBA 735 - Systems Thinking for Business Performance

Credits: 3 (NR)
The business world is increasingly interconnected. "Systems Thinking’’ is a way to understand the structure of a system and its relationship to behavior, and provides a foundation for making more effective management decisions in an interconnected world. The course introduces fundamentals of systems thinking, and involves hands-on use of "systems thinking” tools and techniques to improve performance in a variety of situations spanning different industries.

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

MBA 737 - Information Technology Governance and Policy
Credits: 3 (NR)
Considers specific objectives of IT governance and policy, frameworks that help chart roadmap for this function, and tools and techniques used in specific areas of IT governance.

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MBA 738 - Business Intelligence and Data Mining

Credits: 3 (NR)
Examines how data warehouses and data mining are used to help businesses successfully gather, structure, analyze, understand and act on relevant data, both operational and contextual.

Prerequisite(s): Completion of MBA core requirements, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 741 - Information Technology Auditing

Credits: 3 (NR)
Introduces methodologies to assess security and control issues concerning accounting and other information systems. Key feature of course is applying computer-assisted audit tools and techniques to test effectiveness of application.

Equivalent to ACCT 741

Prerequisite(s): Admission to MSA or MBA program, or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 742 - Corporate Governance and Ethics

Credits: 3 (NR)
Focuses on developing understanding of corporate governance issues and ethical decision-making. Topics include examination of internal and external and international governance issues, and ethical analysis in current business environment.

Equivalent to ACCT 742

Prerequisite(s): Admission to MSA or MBA program, or permission of program director.

Hours of Lecture or Seminar per week: 3
MBA 743 - Corporate Financial Reporting

Credits: 3 (NR)
Addresses contemporary issues in corporate financial reporting. Focuses on role of financial reporting in providing decision-useful information to participants of capital market, and theoretical and empirical assessments of performance.

Equivalent to ACCT 743

Prerequisite(s): Admission to MSA or MBA program, or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MBA 744 - Fraud Deterrence and Detection

Credits: 3 (NR)
Introduces strategies and techniques for fraud prevention and detection. Focuses on financial fraud such as bribery, contract rigging and kickbacks, embezzlement, fraudulent financial reporting, payroll fraud, and misappropriation of inventory and other assets.

Equivalent to ACCT 744

Prerequisite(s): Admission to MSA or MBA program, or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MBA 745 - International Financial Reporting

Credits: 3 (NR)
Examines accounting from an international perspective, including the study of various functional areas of accounting across countries and the reporting requirements encountered by companies engaged in international trade and making foreign direct investments.

Equivalent to ACCT 745

Prerequisite(s): Completion of MBA or MSA core requirements, or permission of program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
MBA 746 - Real Estate Analysis and Valuation

Credits: 3 (NR)
Overview of real estate assets, markets, and decisions. Emphasizes development of analytical techniques and information required for implementation. Includes legal, economic, and public policy perspectives.
Equivalent to GSOM 746

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MBA 747 - Real Estate Finance

Credits: 3 (NR)
Examines financing of residential and income-producing real estate from perspectives of both suppliers and users of funds. Focuses on financing alternatives, primary and secondary markets, and decision implications of available arrangements.
Equivalent to GSOM 747

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MBA 748 - Real Estate Investment

Credits: 3 (NR)
Develops frameworks for analyzing decisions about investing in real estate assets. Focuses on acquisition and analysis of information required to evaluate potential performance of assets. Applications of theories and techniques through case studies.
Equivalent to GSOM 748

Prerequisite(s): Completion of MBA or MSA core requirements or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MBA 752 - Turning Ideas into Successful Companies

Credits: 3 (NR)
An advanced course in entrepreneurship focused on discovery and development of an achievable business concept. The centerpiece of the course is development of the formal business plan and associated presentation materials. Students are assigned to teams and must hypothesize a new business, research and test their hypothesis, and develop a comprehensive written business plan. The plan must be for an actual business that the students intend to start upon the successful completion of the course.
Technology-based projects are encouraged, but not required. Because the course is cross-listed with IT&E and SOM, most teams will include both engineering and business students. Weekly presentations of the team's progress are required.

**Prerequisite(s):** Completion of MBA or MSA core requirements or permission of the program director.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**MBA 795 - Global Business Perspectives**

Credits: 3 (NR)  
Applies MBA core courses to global business enterprise through site visits to facilities located outside the United States.

**Prerequisite(s):** Admission to the MBA program or permission of the program director.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring, Summer

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**MBA 796 - Directed Studies in Business Administration**

Credits: 1-3 (RD)  
Approval by faculty member and MBA program director required prior to registration. Studies specialized topics in business administration not otherwise available in curriculum.

**Prerequisite(s):** Admission to the MBA or MSA program or permission of the program director.

**Notes:** May be repeated for up to 3 credits.

**Hours of Lecture or Seminar per week:** 1-9  
**Hours of Lab or Studio per week:** 0

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**MBA 797 - Special Topics in Business**

Credits: 1-3 (RT)  
Sections established as necessary to focus on various topical issues that emerge in practice of business administration.

**Prerequisite(s):** Admission to the MBA program or permission of the program director.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

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**Master of New Professional Studies (MNPS)**
MNPS 700 - The New Professionalism: Theory and Practice

Credits: 3 (NR)
Experientially explores contemporary and relevant ethical theories and their diverse applications to professional studies field. Examines ethical relationship between professionals and clients, ethical accountability and responsibility, ethos of institutions, and the professional's role in sustaining ethical standards. Explores philosophical and pedagogical assumptions to understand professional management issues, and social and individual purposes of being professional.

Notes: Customized for each track; for detailed course content, contact appropriate program directors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MNPS 702 - The New Professional as Reflective Practitioner

Credits: 3 (NR)
Identifies central problems in epistemology. Examines how an epistemology appropriate to professional practice may be constructed, what is meant by "ways of knowing" and the "reflective practitioner," and implications for professional learning. Studies core issues of generalizability; objective knowledge and understanding; and how evidence, truth, and meaning affect nature of organizational reality and professional's practice. Special attention to developing skills for "double-loop learning," and reflection in professional lives through journals, narrative, autobiography, and imaginative literature.

Notes: Customized for each track; for detailed course content, contact appropriate program directors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MNPS 703 - Technology and Learning in the New Professions

Credits: 3 (NR)
Examines enormous potential for enhancing the way organizations can learn, notably through developing Internet literacy and skills in using differing Internet navigation tools. Focuses on applying technology to real-world problems in different professional work-sites and offers in-depth training in use and development of groupware applications.

Notes: Customized for each track; for detailed course content, contact appropriate program directors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MNPS 704 - Research Methodologies in the New Professionalism
Credits: 3 (NR)
Concentrates on understanding and using research methodologies from such varied sources as Friere, McKeon, and Janowitz, with a practical team activity in which students study organization or aspects of it, using ethnography, field study, or any appropriately defensible research methodology.

Corequisite(s): EDUC 597

Notes: Customized for each track; for detailed course content, contact appropriate program directors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MNPS 720 - Learning Community

Credits: 3 (NR)
Workshops, seminars, and reading groups involving at least 60 hours of contact time and culminating in two-day retreat during which candidates for MS in New Professional Studies (organizational learning) make presentations to class and faculty on research practica. Theme of module is communication, collaboration, and interaction in organizations. After initial one-and-a-half day workshop, MNPS candidates meet with all faculty once a month to give talks and presentations on application of ideas in their organizations, discuss issues in organizational learning, and provide feedback about using collaborative computing technology in learning process.

Equivalent to ODKM 740

Notes: Only for MNPS in organizational learning degree candidates.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

Master of New Professional Studies-Teaching (MNPE)

Offered by the College of Education and Human Development

MNPE 700 - The New Professionalism: Theory and Practice

Credits: 3 (NR)

Explores the philosophical and pedagogical assumptions of teachers as individuals and professionals. Critiques educational issues such as accountability, institutional structures, and professional roles engage teachers to be more just and responsive in their relationships with students, families, and colleagues. Provides a deeper understanding of a teacher's participatory and ethical role in a democracy, which includes questioning the status quo.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
MNPE 702 - The New Professional as a Reflective Practitioner

Credits: 3 (NR)

Explores the central questions of epistemology to encourage depth of understanding of the assumptions and issues of education. Uses reflection to consider how personal and professional identities are influenced by intentions and commitments to learning and teaching. Provides an understanding of the processes of critical inquiry, dialogue, reflection, and action.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MNPE 703 - Technology and Learning in the New Professions

Credits: 3 (NR)

Supports effective technology integration for teaching and learning by constructive knowledge not just of content, technology and pedagogy, but also of their mutually reinforcing relationships. Develops repertoire of technology-mediated learning approaches with appropriate context specific strategies and representations to support learning. Includes concurrent critique of technology and includes equal access to information, critical web literacy, and privacy issues.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MNPE 704 - Research Methodologies in the New Professionalism

Credits: 3 (NR)

Introduces teacher research in a school setting. Supports intentional, systematic, public, ethical, and contextual inquiry into practice; participants form and frame salient questions, take actions to transform curriculum, gather, analyze and interpret multiple forms of data, and share experience in communities of practice.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Mathematical Sciences (MATH)

Offered by the College of Science

Knowledge of high school algebra is a prerequisite for all mathematics courses. In exceptional cases, the prerequisite for a course above the calculus sequence may be waived at the discretion of instructor.
Prior knowledge of linear algebra and single and multivariable calculus assumed in all math graduate courses. A double number separated by a comma (MATH 555, 556) indicates both graduate courses normally constitute a sequence, and the first semester is prerequisite to the second. The prerequisite may be waived by permission of department chair. See also STAT and OR courses.

MATH 104 - Trigonometry and Transcendental Functions

Credits: 2 (NR)
Exponential and logarithmic functions, trigonometric functions, and analytic trigonometry. This course does not satisfy the university's quantitative reasoning requirement. May not be taken for credit after receiving a C or better in MATH 105 or in any MATH course numbered 113 or higher. May not take MATH 105 for credit after receiving a C or better in MATH 104.

Prerequisite(s): Specified score on math placement test. Prerequisite enforced by registration system.

Notes: May not be used as credit toward BA or BS in mathematical sciences.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

MATH 105 - Precalculus Mathematics

Credits: 4 (NR)
Reviews mathematics skills essential to studying calculus. Topics include equations, inequalities, absolute values, graphs, functions, exponential and logarithmic functions, and trigonometry.

Prerequisite(s): Appropriate score on the math placement test or successful completion of the algebra tutorial program offered through the Math Literacy Center. Prerequisite enforced by registration system.

Notes: Call Mathematical Sciences Department at 703-993-1460 for details. May not be used as credit toward BA or BS in mathematical sciences. This course does not satisfy the university's quantitative reasoning requirement for the BA degree. May not be taken for credit after receiving grade of C or better in any MATH course numbered 113 or higher.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

MATH 106 - Quantitative Reasoning

Credits: 3 (NR)
Quantitative skills for real world. Topics include critical thinking, modeling by functions, graphs, growth, scaling, probability, and statistics.

Fulfills general education requirement in quantitative reasoning.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
MATH 108 - Introductory Calculus with Business Applications

Credits: 3 (NR)
Functions, limits, derivative, and integral. Applications of differentiation and integration.

Fulfills general education requirement in quantitative reasoning.

Prerequisites: Specified score on Math Placement Test, or successful completion of self-paced Basic Math Program offered by Math Literacy Center. Prerequisite enforced by registration system.

Notes: Call Mathematical Sciences Department at 703-993-1460 for details. Students who have received credit for MATH 113 or 114 may not receive credit for this course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 110 - Introductory Probability

Credits: 3 (NR)
Elementary set theory, probability, and statistics.

Fulfills general education requirement in quantitative reasoning.

Prerequisites: Specified score on Math Placement Test, or successful completion of self-paced Basic Math Program offered by Math Literacy Center. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 111 - Linear Mathematical Modeling

Credits: 3 (NR)
Matrix algebra, systems of linear equations, Markov chains, difference equations, and data fitting.

Fulfills general education requirement in quantitative reasoning.

Prerequisites: Specified score on Math Placement Test, or successful completion of self-paced Basic Math Program offered by Math Literacy Center. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 112 - Discrete Mathematics for IT

Credits: 3 (NR)
Introduces ideas of discrete mathematics including mathematical induction, sets, logic, graphs, trees, basic counting arguments,
and discrete probability. Students who have received credit for MATH 125 may not receive credit for this course.

**Prerequisite(s):** Specified score on Math Placement Test, or successful completion of self-paced Algebra Tutorial Program offered through Math Learning Center. Prerequisite enforced by registration system.

**Notes:** Intended for IT students; does not count toward a major or minor in mathematics.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**MATH 113 - Analytic Geometry and Calculus I**

Credits: 4 (NR)  
Functions, limits, the derivative, maximum and minimum problems, the integral, and transcendental functions.

Fulfills general education requirement in quantitative reasoning.

**Prerequisite(s):** C or better in MATH 104 or MATH 105 or specified score on math placement test. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 1

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**MATH 114 - Analytic Geometry and Calculus II**

Credits: 4 (NR)  
Methods of integration, conic sections, parametric equations, infinite series, and power series.

**Prerequisite(s):** Grade of C or better in MATH 113. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 1

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**MATH 115 - Analytic Geometry and Calculus I (Honors)**

Credits: 4 (NR)  
More challenging version of MATH 113. Functions, limits, the derivative, maximum and minimum problems, the integral, and transcendental functions.

Fulfills general education requirement in quantitative reasoning.

**Prerequisite(s):** Permission of department. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 1
MATH 116 - Analytic Geometry and Calculus II (Honors)

Credits: 4 (NR)
More challenging version of MATH 114. Methods of integration, conic sections, parametric equations, infinite series, and power series.

Prerequisite(s): Successful completion of MATH 115, or grade of A in MATH 113 and recommendation of MATH 113 instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 1

MATH 123 - Calculus with Algebra/Trigonometry, Part A

Credits: 3 (NR)
Math 123, with 124 is a two semester sequence for students with limited math background who desire careers in the sciences. In two semesters, students progress from algebra through the basic calculus covered in Math 113. Math 123 integrates the beginnings of calculus through the derivative with relevant precalculus algebra and trigonometry.

Notes: Students who successfully complete Math 123-124 are considered the same as having successfully completed MATH 113 and can sign up for Math 114, Calculus II.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

MATH 124 - Calculus with Algebra/Trigonometry, Part B

Credits: 3 (NR)
Math 123, with 124 is a two semester sequence for students with limited math background who desire careers in the sciences. In two semesters, students progress from algebra through the basic calculus covered in Math 113. Math 124 will review basic differentiation and applications and then proceed to cover integration including transcendental functions.

Prerequisite(s): C or better in MATH 123.

Notes: Students who successfully complete Math 123-124 are considered the same as having successfully completed MATH 113 and can sign up for Math 114, Calculus II.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

MATH 125 - Discrete Mathematics I

Credits: 3 (NR)
Introduces ideas of discrete mathematics and combinatorial proof techniques including mathematical induction, sets, graphs,
trees, recursion, and enumeration.

Fulfills general education requirement in quantitative reasoning.

Prerequisite(s): Specified score on Math Placement Test or successful completion of self-paced Algebra Tutorial Program offered by Math Learning Center. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 203 - Linear Algebra

Credits: 3 (NR)
Systems of linear equations, linear independence, linear transformations, inverse of a matrix, determinants, vector spaces, eigenvalues, eigenvectors, and orthogonalization.

Prerequisite(s): C or better in MATH 114. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 213 - Analytic Geometry and Calculus III

Credits: 3 (NR)
Partial differentiation, multiple integrals, line and surface integrals, and three-dimensional analytic geometry.

Prerequisite(s): Grade of C or better in MATH 114. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 214 - Elementary Differential Equations

Credits: 3 (NR)
First-order ODEs, higher-order ODEs, Laplace transforms, linear systems, nonlinear systems, numerical approximations, and modeling.

Prerequisite(s): Grade of C or better in MATH 213 or 215. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 215 - Analytic Geometry and Calculus III (Honors)
Credits: 3 (NR)
Vectors and vectorvalued functions, partial differentiation, multiple integrals, line integrals, surface integrals, and transformation of coordinates.

Prerequisite(s): Grade of C or better in MATH 113 and 114. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**MATH 216 - Theory of Differential Equations**

Credits: 3 (NR)
First- and second-order equations, existence uniqueness of solutions, systems of differential equations, and phase plane analysis.

Prerequisite(s): Grade of C or better in MATH 203 and 213 or 215. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**MATH 271 - Mathematics for the Elementary School Teachers I**

Credits: 3 (NR)
Concepts and theories underlying elementary school mathematics, including problem solving, whole numbers and numeration, whole numbers operations and properties, number theory, fractions, decimals, ratio and proportion, and integers. Intended for school educators.

Notes: Does not count toward major in mathematics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**MATH 272 - Mathematics for the Elementary School Teachers II**

Credits: 3 (NR)
MATH 271 recommended before enrolling. Continuation of MATH 271. Topics include rational and real numbers, introduction to algebra, geometry, statistics, and probability.

Notes: Intended for school educators; does not count toward major in mathematics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**MATH 290 - Introduction to Advanced Mathematics**
Introduction to proofs and the language of mathematics. Topics include induction, equivalence relations, cardinality and basic properties of the real numbers. Designated as a writing intensive course for mathematics majors.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** Grade of C or better in MATH 114. Prerequisite enforced by registration system.

**Notes:** Primarily intended for mathematics majors.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**MATH 301 - Number Theory**

Credits: 3 (NR)  
Prime numbers, factorization, congruences, and Diophantine equations.

**Prerequisite(s):** 6 math credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**MATH 302 - Foundations of Geometry**

Credits: 3 (NR)  
Fundamental concepts of incidence. Axioms of Euclidean geometry and the resulting theory, and axioms and development of non-Euclidean and projective geometry.

**Prerequisite(s):** 6 math credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**MATH 307 - Mathematical Modeling**

Credits: 3 (NR)  
Focuses on the development and analysis of mathematical models that make qualitative and quantitative predictions. Students will address particular situations while learning general modeling strategies.

**Prerequisite(s):** MATH 203 and MATH 214 or MATH 216.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.
MATH 313 - Introduction to Applied Mathematics

Credits: 3 (NR)
Vector differential calculus, vector integral calculus, Fourier analysis, and complex analysis.

Prerequisite(s): Grade of C or better in MATH 213 or 215 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 314 - Introduction to Applied Mathematics

Credits: 3 (NR)

Prerequisite(s): Grade of C or better in MATH 214 or 216. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 315 - Advanced Calculus I

Credits: 3 (NR)
Number system, functions, sequences, limits, continuity, differentiation, integration, transcendental functions, and infinite series.

Prerequisite(s): Grade of C or better in MATH 213 or 215 and 290. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 316 - Advanced Calculus II

Credits: 3 (NR)
Sequences of functions, Taylor series, vectors, functions of several variables, implicit functions, multiple integrals, and surface integrals.

Prerequisite(s): Grade of C or better in MATH 315. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 321 - Abstract Algebra
Credits: 3 (NR)
Theory of groups, rings, fields.

Prerequisite(s): Grade of C or better in MATH 213 or 215 and 290. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 322 - Advanced Linear Algebra

Credits: 3 (NR)
Abstract vector spaces, linear independence, bases, linear transformations, matrix algebra, inner product, and special topics.

Prerequisite(s): Grade of C or better in MATH 203 and 290. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 325 - Discrete Mathematics II

Credits: 3 (NR)
Advanced counting, binomial identities, generating functions, advanced recurrence, inclusion-exclusion, and network flows.

Prerequisite(s): Grade of C or better in MATH 125. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 351 - Probability

Credits: 3 (NR)
Random variables, probability functions, special distributions, and limit theorems.

Prerequisite(s): Grade of C or better in MATH 213 or 215. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 352 - Statistics

Credits: 3 (NR)
Estimation, decision theory, testing hypothesis, correlation, linear models, and design.

Prerequisite(s): Grade of C or better in MATH 351. Prerequisite enforced by registration system.
MATH 400 - History of Math

Credits: 3 (NR)
Explores internal controversies and dynamics of mathematics in larger intellectual and social settings. Topics vary but might include differential equations devised for mechanics and astronomy by Euler, Lagrange, and Laplace; foundation of mathematical analysis from Cauchy to Weierstrass; algebras of Galois and Boole; or creation of non-Euclidean geometry and Cantor’s transfinite sets.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses, and completion of MATH 290. Prerequisite enforced by registration system.

Notes: Credits may not be used toward "upper division" math hours required of math majors.

MATH 405 - Honors Thesis in Mathematics I

Credits: 3 (NR)
A project, which is intended to result in a thesis, is to be chosen and completed under the guidance of a full-time faculty member. An oral presentation is required for MATH 405.

Prerequisite(s): MATH 315, 3 additional credits of MATH above the 300 level (excluding MATH 400), and admission to the Mathematics Honors Program.

MATH 406 - Honors Thesis in Mathematics II

Credits: 3 (NR)
A project, which is intended to result in a thesis, is to be chosen and completed under the guidance of a full-time faculty member. Oral and written presentations are required in MATH 406.

Prerequisite(s): MATH 405 Prerequisite enforced by registration system.
MATH 411 - Functions of a Complex Variable

Credits: 3 (NR)
Analytic functions, contour integration, residues, and applications to such topics as integral transforms, generalized functions, and boundary value problems.

Prerequisite(s): Grade of C or better in MATH 214 or 216. Prerequisite enforced by registration system.

 Hours of Lecture or Seminar per week: 3
 Hours of Lab or Studio per week: 0

MATH 413 - Modern Applied Mathematics I

Credits: 3 (NR)

Prerequisite(s): Grade of C or better in MATH 203 and 214 or 216. Prerequisite enforced by registration system.

 Hours of Lecture or Seminar per week: 3
 Hours of Lab or Studio per week: 0

MATH 414 - Modern Applied Mathematics II

Credits: 3 (NR)
Continuation of MATH 413, which involves synthesis of pure mathematics and computational mathematics. Fourier analysis and its role in applied mathematics developed (differential equations and approximations). Discrete aspects emphasized in computational models.

Prerequisite(s): Grade of C or better in MATH 413. Prerequisite enforced by registration system.

 Hours of Lecture or Seminar per week: 3
 Hours of Lab or Studio per week: 0

MATH 431 - Topology

Credits: 3 (NR)
Metric spaces, topological spaces, compactness, and connectedness.

Prerequisite(s): C or better in MATH 315. Prerequisite enforced by registration system.

 Hours of Lecture or Seminar per week: 3
 Hours of Lab or Studio per week: 0
MATH 441 - Deterministic Operations Research

Credits: 3 (NR)

Prerequisite(s): Grade of C or better in MATH 203 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 442 - Stochastic Operations Research

Credits: 3 (NR)

Equivalent to OR 442

Prerequisite(s): Grade of C or better in MATH 351. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 446 - Numerical Analysis I

Credits: 3 (NR)
Significant figures, round-off errors, iterative methods of solution of nonlinear equations of a single variable, solutions of linear systems, iterative techniques in matrix algebra, interpolation and polynomial approximation.

Prerequisite(s): Grade of C or better in MATH 203 and CS 112. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 447 - Numerical Analysis II

Credits: 3 (NR)

Prerequisite(s): Grade of C or better in Math 214 or 216 and 446. Prerequisite enforced by registration system.
MATH 453 - Advanced Mathematical Statistics

Credits: 3 (NR)
Maximum likelihood tests, sufficiency, most powerful tests, distributions of quadratic forms, topics from nonparametric statistics, Bayesian statistics and linear models.

Prerequisite(s): C or better in MATH 352.

MATH 478 - Introduction to Partial Differential Equations with Numerical Methods

Credits: 3 (NR)
Introduces basic facts about partial differential equations, including elliptic equations, parabolic equations and hyperbolic equations. Methods of solution, characteristics, initial/boundary-value problems, and numerical approximation techniques.

Prerequisite(s): C or better in MATH 203 and 214 or 216. Prerequisite enforced by registration system.

MATH 491 - Reading and Problems

Credits: 1-3 (RT)
For mathematical sciences majors only. Independent study in math.

Notes: Must be arranged with instructor before registering.

MATH 492 - Reading and Problems

Credits: 1-3 (RT)
For mathematical sciences majors only. Independent study in math.

Prerequisite(s): For mathematical science majors only. Permission of Instructor required.

Notes: Must be arranged with instructor before registering.
MATH 493 - Topics in Applicable Mathematics

Credits: 3 (RT)
Topics that have been successfully used in applications of mathematics.

Prerequisite(s): 6 credits of math at or above 310 level.

Notes: Subject determined by instructor.

MATH 494 - Topics in Pure Mathematics

Credits: 3 (RT)
Topics of pure math not covered in other courses. Topics might include Galois theory, cardinal and ordinal arithmetic, measure theory, mathematical logic, and differential geometry.

Prerequisite(s): 6 credits of math at or above 310 level.

Notes: Subject determined by instructor.

MATH 495 - Undergraduate Seminar

Credits: 1 (RD)
Prerequisite(s): Permission of instructor.

MATH 551 - Regression and Time Series

Credits: 3 (NR)
Mathematics of regression, exponential smoothing, time series, and forecasting. Material included in this course constitutes Society of Actuaries Validation by Educational Experience (VEE) for applied statistics and corresponds to part of Casualty Actuary Society Exam 3.
Prerequisite(s): MATH 352, STAT 652, SOA Exam P, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 554 - Financial Mathematics

Credits: 3 (NR)
Simple and compound interest, annuities, present and future value, yield rates, capital budgeting, amortization schedules, mortgages, bonds. Material corresponds to the Society of Actuaries Exam: Financial Mathematics (FM). Not appropriate for graduate science and engineering majors not considering actuarial or financial career. Cannot be counted toward MS or PhD degree in mathematics.

Prerequisite(s): MATH 113

Corequisite(s): MATH 114

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 555 - Actuarial Modeling I

Credits: 3 (NR)
Two-semester sequence covering portions of the material corresponding to the Society of Actuaries Exam M, Casualty Actuary Society Exam 3, and Joint Board Exam EA1. The remaining material for these exams is covered in MATH 551 and 653. Topics include survival distribution and life tables, life insurance, life annuities, net premiums, net premium reserves, multiple life and multiple decrement models, pensions, insurance models including expense, and nonforfeiture benefits and cash values.

Prerequisite(s): MATH 554 and either MATH 351 or STAT 344.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 556 - Actuarial Modeling II

Credits: 3 (NR)
Two-semester sequence covering portions of the material corresponding to the Society of Actuaries Exam M, Casualty Actuary Society Exam 3, and Joint Board Exam EA1. The remaining material for these exams is covered in MATH 551 and 653. Topics include survival distribution and life tables, life insurance, life annuities, net premiums, net premium reserves, multiple life and multiple decrement models, pensions, insurance models including expense, and nonforfeiture benefits and cash values.

Prerequisite(s): MATH 554 and either MATH 351 or STAT 344.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
MATH 557 - Financial Derivatives

Credits: 3 (NR)

Prerequisite(s): MATH 554 and either MATH 351 or STAT 344, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MATH 600 - Special Topics in Mathematics

Credits: 1-6 (RT)
Mathematical workshops, special courses, or other projects.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

MATH 601 - Analysis I for Teachers

Credits: 3 (NR)
Develops continuous ideas of calculus with particular emphasis on concepts as opposed to computational aspects of calculus. Specific topics include decimal representation of real numbers, sequences, series, and limits; differentiation to find speed, slopes of curves, and tangents; integration to find volumes and distances and area under curves. Optimization problems including maximization of area and volume, and modeling of these concepts. Graphing techniques supported by theory of calculus and graphing utilities such as TI-83 calculator or computer software such as Maple.

Prerequisite(s): Open to in-service teachers of mathematics at middle or secondary level. Others may enroll with permission of instructor.

Notes: Background in mathematics desirable but not necessary. Some topics from college algebra will be reviewed in class, but thorough understanding of high school algebra and trigonometry expected.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

MATH 602 - Analysis II for Teachers

Credits: 3 (NR)
Develops continuous ideas of calculus with particular emphasis on concepts as opposed to computational aspects of calculus. Specific topics include decimal representation of real numbers, sequences, series, and limits; differentiation to find speed, slopes
of curves, and tangents; integration to find volumes and distances and area under curves. Optimization problems including maximization of area and volume, and modeling of these concepts. Graphing techniques supported by theory of calculus and graphing utilities such as TI-83 calculator or computer software such as Maple.

**Prerequisite(s):** Open to in-service teachers of mathematics at middle or secondary level. Others may enroll with permission of instructor.

**Notes:** Background in mathematics desirable but not necessary. Some topics from college algebra will be reviewed in class, but thorough understanding of high school algebra and trigonometry expected.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 1

### MATH 604 - Geometry for Teachers

Credits: 3 (NR)  
Covers standard topics from Euclidean geometry, and includes discussion of non-Euclidean geometries. Emphasizes informal and explorative approach to geometry, and makes use of geometry sketchpad. Other topics include geometric constructions, and role of proof in geometry.

**Prerequisite(s):** Open to in-service teachers of mathematics at middle or secondary level. Others may enroll with permission of instructor.

**Notes:** Background in mathematics desirable but not necessary.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 1

### MATH 605 - Discrete/Finite Mathematics for Teachers

Credits: 3 (NR)  
Thorough understanding of high school algebra assumed. Discusses finite mathematics in juxtaposition to continuous ideas of calculus. Topics may consist of elementary counting and combinatorics including recursion and difference equations and their analogy to calculus; thorough discussion of probability and central measures of statistics; and graph theory and its connection to geometry.

**Prerequisite(s):** Open to in-service teachers of mathematics at middle or secondary level. Others may enroll with permission of instructor.

**Notes:** Background in mathematics desirable but not necessary.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 1

### MATH 607 - Algebraic Structure for Teachers
Expands on customary operations on integers and rationals to discuss systems that mimic these operations. Emphasizes multiplicative and additive inverses and their corresponding identities as they occur in other systems. Topics might include permutation groups, rigid transformations, groups of symmetry of the plane and connection to geometry, and matrices treated as linear transformations and connections to solutions of systems of equations.

Prerequisite(s): Open to in-service teachers of mathematics at middle school level. Others may enroll with permission of instructor.

Notes: Background in mathematics desirable but not necessary. Thorough understanding of high school algebra assumed.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

MATH 608 - Problem Solving in Mathematics

Credits: 3 (NR)
Introduces variety of challenging mathematical problems appropriate for middle school student to analyze, and solving problems using mathematics learned in previous courses. Also asks students to search for such problems and orally present solutions.

Prerequisite(s): Open to in-service teachers of mathematics at middle school level. Others may enroll with permission of instructor.

Notes: Background in mathematics or science desirable but not necessary. Assumes exposure to most of topics covered in MATH 601, 604, 605, and 607.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

MATH 610 - Number Systems and Number Theory for K-8 Teachers

Credits: 3 (NR)
This course covers the topics: ways of representing numbers, relationships between numbers, number systems, the meanings of operations and how they relate to one another, and computation within the number system as a foundation for algebra. It also includes episodes in history and development of the number system, and will examine the developmental sequence and learning trajectory as children learn this material.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 611 - Geometry and Measurement for K-8 Teachers

Credits: 3 (NR)
The course explores the foundations of informal measurement and geometry in one, two, and three dimensions. The van Hiele model for geometric learning is used as a framework for how children build their understanding of length, area, volume, angles, and geometric relationships. Visualization, spatial reasoning, and geometric modeling are stressed. As appropriate, transformational geometry, congruence, similarity, and geometric constructions will be discussed.
MATH 612 - Probability and Statistics for K-8 Teachers

Credits: 3 (NR)
An introduction to probability, descriptive statistics, and data analysis. Topics studied will include the exploration of randomness, data representation, modeling. Descriptive statistics will include measures of central tendency, dispersion, distributions, and regression. The analysis of experiments requiring hypothesizing, experimental design and data gathering will also be discussed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 613 - Algebra and Functions for K-8 Teachers

Credits: 3 (NR)
The course will examine representing and analyzing mathematical situations and structures using generalization and algebraic symbols and reasoning. Attention will be given to the transition from arithmetic to algebra, working with quantitative change, and the description of and prediction of change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 614 - Rational Numbers and Proportional Reasoning for K-8 Teachers

Credits: 3 (NR)
This course will cover the basic number strands in fractions and rational numbers, decimals and percents, and ratios and proportions in the school curriculum. Instruction will cover interpretations, computations, and estimation with a coordinated program of activities that develop both rational number concepts and skills and proportional reasoning.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 619 - Topics in Mathematical Logic

Credits: 3 (RT)
Special topics in foundations of mathematics not included in regular mathematics curriculum. May be repeated for credit.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
MATH 621 - Algebra I

Credits: 3 (NR)
Groups, linear algebra, and matrix groups.

Prerequisite(s): Familiarity with basic properties of groups and rings, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 624 - Euclidean Geometry

Credits: 3 (NR)
Euclidean space, geometry of k-dimensional planes, the affine structure of Euclidean space, rigid motions and similarities, parallelotopes and volumes, convex polytopes, quadric surfaces, and additional topics by instructor's choice.

Prerequisite(s): MATH 315 and MATH 322, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 625 - Numerical Linear Algebra

Credits: 3 (NR)
Theory and development of numerical algorithms for solving variety of matrix problems: linear systems, least squares problems, eigenvalue problems, and singular value decomposition. Direct and iterative method, analysis of sensitivity to rounding errors, and applications.

Equivalent to CSI 740

Prerequisite(s): Computer literacy, including some programming experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 629 - Topics in Algebra and Combinatorics

Credits: 3 (RT)
Special topics in pure and applied algebra or combinatorics not covered in regular algebra or combinatorics sequence. May be repeated for credit.

Prerequisite(s): Permission of instructor.

Notes: Topic may not be repeated.
MATH 631 - Topology I: Topology of Metric Spaces

Credits: 3 (NR)
Covers definition and basic examples of metric spaces, open and closed sets, subspaces and finite products, sequences and convergence, compactness and separability, continuous functions, uniform continuity, metric space C(X) and uniform convergence, and homotopy.

Prerequisite(s): MATH 315 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 639 - Topics in Geometry and Topology

Credits: 3 (RD)
Special topics in geometry and topology not covered in regular geometry and topology sequence. May be repeated for credit.

Prerequisite(s): Permission of instructor.

Notes: Topic may not be repeated.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MATH 641 - Combinatorics and Graph Theory

Credits: 3 (NR)
Covers enumerative combinatorics, including partially ordered sets; Moebius inversion and generating functions; and major topics in graph theory such as graph coloring, Ramsey theory, and matching.

Prerequisite(s): MATH 321 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 644 - Convex and Discrete Geometry

Credits: 3 (NR)
Basic properties of Euclidean space, convex sets and convex cones, convex hulls, extremal structure of convex sets, support and separation properties, polyhedra and polytopes, special classes of convex sets, Helly-type theorems, selected problems of discrete
MATH 653 - Construction and Evaluation of Actuarial Models I

Credits: 3 (NR)
Economics of insurance, individual risk models for short term, collective risk models for single period, collective risk models over an extended period, and applications of risk theory. Material included in this course corresponds to portions of the Society of Actuaries Exam M and Casualty Actuary Society Exam 3. The remaining material for these exams is covered in MATH 551, 555, and 556.

Prerequisite(s): MATH 351 or STAT 644 are required. MATH 555 is recommended but not required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 654 - Construction and Evaluation of Actuarial Models II

Credits: 3 (NR)
Nature and properties of survival and loss models, methods of estimates from complete and incomplete data, tabular and parametric models, and practical issues in survival model estimation. Material included in this course corresponds to most of the Society of Actuaries Exam C and Casualty Actuary Society Exam 4.

Prerequisite(s): MATH 556 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 655 - Pension Valuation

Credits: 3 (NR)
Basic mathematics used in pension actuarial work without regard to pension law. Material included in this course corresponds to all of the Joint Board Exam EA-2A and portions of the Society of Actuaries Exam 8. This course cannot be counted toward the MS or PhD degree in mathematics.

Prerequisite(s): MATH 556, SOA Exam EA-1, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 661 - Complex Analysis I
Credits: 3 (NR)
Topology of complex numbers, holomorphic functions, series, complex integration. Meromorphic, multivalued, and elliptic functions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 671 - Fourier Analysis

Credits: 3 (NR)
Study of fundamental ideas in Fourier analysis. Topics include orthonormal systems, Fourier series, continuous and discrete Fourier transform theory, generalized functions, and introduction to spectral analysis. Uses applications to physical sciences, linear systems theory, and signal processing to integrate topics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 673 - Dynamical Systems

Credits: 3 (NR)
Contemporary topics in nonlinear dynamical systems illustrated in mathematical models from physics, ecology, and population dynamics. Traditional qualitative analysis of difference and differential equations provides background for understanding chaotic behavior when it occurs in these models. Topics include stability theory, fractals, Lyapunov exponents, and chaotic attractors.

Prerequisite(s): Elementary courses in linear algebra and differential equations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 674 - Stochastic Differential Equations

Credits: 3 (NR)
Introduces stochastic calculus and differential equations. Includes Wiener process, Ito and Stratonovich integrals, Ito formula, martingales, diffusions, and applications, including financial applications. Simulations and numerical approximations of solutions.

Prerequisite(s): MATH 214 and 351

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 675 - Linear Analysis
Credits: 3 (NR)
Metric spaces, normed linear spaces, completeness, compactness, continuous (bounded) linear transformations, Banach spaces, Hilbert spaces, and orthogonal series.

Prerequisite(s): MATH 315 and MATH 322, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 677 - Ordinary Differential Equations

Credits: 3 (NR)
Qualitative and quantitative theory of ordinary differential equations. Phase portrait analysis of linear and nonlinear systems, including classification of stable and unstable equilibrium states and periodic orbits. Poincare-Bendixson theorem, Lyapunov stability and Lyapunov functions, and bifurcation theory. Optional topics include averaging and perturbation methods, numerical solution techniques, and chaos.

Prerequisite(s): MATH 214 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 678 - Partial Differential Equations

Credits: 3 (NR)
Physical examples, characteristics, boundary value problems, integral transforms, and other topics, such as variational, perturbation, and asymptotic methods.

Prerequisite(s): Elementary differential equations course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 679 - Topics in Analysis and Potential Theory

Credits: 3 (RT)
Special topics not covered in regular analysis or potential theory sequence. May be repeated for credit.

Notes: Topic may not be repeated.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 680 - Industrial Mathematics
Credits: 3 (NR)
Takes examples from industry and goes through complete solution process: formulation of mathematical model of problem; solution, possibly by numerical approximation; and interpretation and presentation of results. Emphasizes working in groups, relating mathematics to concrete situations, and communication and presentation skills.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 683 - Modern Optimization Theory

Credits: 3 (NR)
Introduces basic mathematical ideas and methods for solving linear and nonlinear programming problems, with emphasis on mathematical aspects of optimization theory. Reviews classical topics of linear programming, and covers recent developments in linear programming, including interior point method. Considers basic results in nonlinear programming, including very recent developments in this field.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 685 - Numerical Methods

Credits: 3 (NR)
Computational techniques for solving problems arising in science and engineering. Includes theoretical development as well as implementation, efficiency, and accuracy issues in using algorithms and interpreting results. Specific topics include linear and nonlinear systems of equations, polynomial interpolation, numerical integration, and introduction to numerical solution of differential equations.

Equivalent to CSI 700

Prerequisite(s): Computer literacy, including some programming experience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 686 - Numerical Solutions of Differential Equations

Credits: 3 (NR)
Finite difference methods for initial value problems, two-point boundary value problems, Poisson equation, heat equation, and first-order partial differential equations.

Prerequisite(s): MATH 214 and MATH 446 or 685.
MATH 687 - Variational Methods

Credits: 3 (NR)
Weak formulation of partial differential equations, energy principles, Galerkin approximations, and finite element methods. Includes review and development of necessary analysis.

Prerequisite(s): MATH 446 or 685, and elementary differential equations course.

MATH 689 - Topics in Applied and Computational Mathematics

Credits: 3 (RT)
Special topics in applied and computational mathematics not covered in the regular applied and computational mathematics sequence. May be repeated for credit.

Prerequisite(s): Permission of instructor.

Notes: Topic may not be repeated.

MATH 697 - Independent Reading and Research

Credits: 1-6 (RT)
In areas of importance, but with insufficient demand to justify a regular course, students may undertake a course of study under the supervision of a consenting faculty member. Written statement of the content of the course and a tentative reading list is normally submitted as part of the request for approval. Literature review, project report, or other written product is normally required. May be repeated for credit.

Prerequisite(s): Graduate standing and permission of instructor.

MATH 721 - Algebra II

Credits: 3 (NR)
Rings, fields, and Galois theory.
Prerequisite(s): MATH 621.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 722 - Algebraic Topology

Credits: 3 (NR)
Covers simplices and simplicial complexes, cycles and boundaries, simplicial homology, homological algebra, homotopy and the fundamental group, cohomology.

Prerequisite(s): MATH 621 and 631, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 723 - Combinatorial Structures

Credits: 3 (NR)
Studies structural properties of objects encountered in pure and applied combinatorics. Topics include partially ordered sets, codes, designs, matroids, buildings, symmetrical structures, permutation groups, and face lattices of polytopes.

Prerequisite(s): MATH 321 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 724 - Commutative Algebra

Credits: 3 (NR)
Study of commutative rings and their ideals, and of modules over commutative rings and their homological properties. More specific topics include Noetherian rings, primary decomposition, completions, graded rings and dimension theory with applications to algebraic geometry.

Prerequisite(s): MATH 621.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 732 - Topology II: Set-Theoretic Topology

Credits: 3 (NR)
Topics include review of basic set theory (including cardinal numbers products of sets, the Axiom of Choice), definition of
topological spaces, bases for topological spaces, forming new topological spaces by taking subspace, quotients, and products, separation properties (Hausdorff, regular, Tychonoff, and normal spaces) compactness, the Lindelof property, separability, connectedness, continuity and homeomorphism, manifolds.

Prerequisite(s): MATH 631 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 740 - Differential Topology

Credits: 3 (NR)
Differential forms, manifolds, smooth maps, vector fields, the Euler characteristic, integration on manifolds, and de Rham cohomology.

Prerequisite(s): MATH 621 and Math 631, or equivalent.

Notes: MATH 740 will be an elective course acceptable (but not required) for the PhD Degree in the Mathematical Sciences offered by the Department of Mathematical Sciences.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MATH 762 - Complex Analysis II

Credits: 3 (NR)
Harmonic functions, generalizations of the maximum principle, entire and meromorphic functions, analytic continuation, and the Riemann mapping theorem.

Prerequisite(s): MATH 661.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 763 - Functions of Several Complex Variables

Credits: 3 (NR)
Covers the important results for analytic functions in several variables, including analyticity in several variables and the differences between the theory of one and the theory of several complex variables.

Prerequisite(s): MATH 661 and 762, or equivalent preparation in one complex variable.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
MATH 772 - Wavelet Theory

Credits: 3 (NR)
Study of the theory and computational aspects of wavelets and the wavelet transform. Emphasizes computational aspects of wavelets, defining the Fast Wavelet Transform in one and two dimensions. Developing the appropriate numerical algorithms. Includes developing the theory of wavelet bases on the real line, discussing multiresolution analysis, splines, time-frequency localization, and wavelet packets.

Equivalent to CSI 746

Prerequisite(s): MATH 315 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 776 - Measure and Integration

Credits: 3 (NR)
Lebesgue measure and integration. Theory of Lp spaces with p between one and infinity on the real line. Theory of linear operators on Banach spaces, including the Hahn-Banach theorem, open mapping theorem, closed graph theorem and the uniform boundedness principle.

Prerequisite(s): MATH 675.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 781 - Advanced Methods in Applied Mathematics

Credits: 3 (NR)
Bifurcation theory and perturbation methods for solutions in ordinary and partial differential equations. This course will develop and apply these mathematical tools in current scientific fields, such as biology, materials science, or financial mathematics.

Prerequisite(s): MATH 677 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MATH 784 - Nonlinear Functional Analysis

Credits: 3 (NR)
Techniques in nonlinear functional analysis with applications. Contraction mapping principle, Frechet and higher derivatives, the implicit function theorem, Lyapunov-Schmidt method, and bifurcation theory. Finite and infinite dimensional degree theory with applications in partial differential equations.

Prerequisite(s): MATH 675 or permission of instructor.
Notes: Different backgrounds may be appropriate, but generally, a student is expected to be an upper level graduate student who has already taken Linear Analysis. Since the applications given in the course are for differential equations, some familiarity with differential equations is extremely useful.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**MATH 790 - Classical Potential Theory**

Credits: 3 (NR)  
Potential theory of Laplace's equation in Euclidean space. Harmonic functions, superharmonic functions, potentials, polar sets and capacity, the Dirichlet problem, the Martin boundary, boundary behavior of superharmonic functions using real variable techniques, and minimal fine limit techniques.

Prerequisite(s): Math 675 and 776

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**MATH 795 - Graduate Seminar**

Credits: 1 (NR)  
Mandatory for all PhD students. Weekly seminar graded on presentations and attendance. Faculty presentations on potential thesis topics and presentations by students.

Prerequisite(s): Admission to PhD program in mathematical sciences.

Hours of Lecture or Seminar per week: 1  
Hours of Lab or Studio per week: 0

**MATH 799 - MS Thesis**

Credits: 1-6 (RD)  
Original or compilatory work evaluated by committee of three faculty members.

Hours of Lecture or Seminar per week: 1-6  
Hours of Lab or Studio per week: 0  
Grading: S/NC

**MATH 800 - Studies for the Doctor of Philosophy in Education**

Credits: 1-6 (NR)  
Program of studies designed by student's discipline director and approved by student's doctoral committee, which brings the
student to participate in current research of discipline director and results in paper reporting the original contributions of student. Enrollment may be repeated.

**Prerequisite(s):** Admission to PhD in education program to study in mathematical sciences.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

### MATH 998 - PhD Thesis Proposal

Credits: 1-9 (RD)  
Work on research proposal that forms basis for doctoral dissertation. May be repeated for credit. No more than 24 credit hours of 998 and 999 may be applied to doctoral degree requirements.

**Prerequisite(s):** Successful completion of qualifying exam.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit

### MATH 999 - PhD Thesis Research

Credits: 1-12 (RD)  
Formal record of commitment to doctoral dissertation research under the direction of a faculty member. May be repeated for credit. No more than 24 credit hours of 998 and 999 may be applied to doctoral degree requirements.

**Prerequisite(s):** Advancement to doctoral candidacy.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/IP

### Medical Technology (MTCH)

Offered by the College of Science

*Prerequisite for the following courses except 200: completion of requirements for BS with major in medical technology except for 30 credits of professional study, and admission to school of medical technology approved by National Accrediting Agency for Clinical Laboratories.*

### MTCH 200 - Introduction to Medical Technology

Credits: 1 (NR)  
Introduction to the profession of medical technology.
MTCH 401 - Orientation to the Problems and Practices of the Clinical Laboratory

Credits: 1-2 (NR)
Orientation to clinical lab; specimen collection and record keeping; management principles and problems; educational theories as they apply to the teaching of clinical laboratory procedures; and quality control principles.

Notes: Not offered on campus.

MTCH 402 - Clinical Hematology and Coagulation

Credits: 1-8 (RD)
Morphology of blood cells in health and disease; theories of hematopoiesis and coagulation; techniques for measurement of hematologic parameters; and hematologic pathologies and their lab evaluation.

Notes: Not offered on campus.

MTCH 403 - Clinical Microscopy

Credits: 1-3 (NR)
Methods for the routine examination of urine, feces, and certain other body fluids, especially the microscopic identification of normal and pathologic components. Includes a study of the kidney and theories of microscopy.

Notes: Not offered on campus.

MTCH 404 - Serology and Immunohematology

Credits: 1-7 (RD)
Clinical lab procedures involving antigen-antibody reactions, and theoretical bases of such procedures. Includes both diagnostic and blood bank techniques.

Notes: Not offered on campus.
MTCH 405 - Clinical Microbiology

Credits: 1-8 (RD)
Biology and pathology of bacteria, rickettsia, fungi, parasites, and viruses of clinical importance and their culture and identification.

Notes: Not offered on campus.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0

MTCH 406 - Clinical Chemistry

Credits: 1-10 (RD)
Chemical reactions and procedures used in clinical determinations on blood, urine, and cerebral spinal fluid. Includes manual, automated methods of chemical analyses.

Notes: Not offered on campus.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

Military Science (MLSC)

Offered by the University

MLSC 100 - Introduction to Army/ROTC

Credits: 1 (NR)
Introduces leadership values and ethics; responsibilities of officership; the organization, customs, and traditions of the U.S. Army; time management; and physical well-being. Includes a laboratory in applied leadership, common military tasks, and physical fitness.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

MLSC 101 - Leadership Skills II
Credits: 1 (NR)
Introduces leadership principles, dimensions, styles, and assessment, among other varied topics. Includes a laboratory in applied leadership, common military tasks, and physical fitness.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

MLSC 200 - Self/Team Development

Credits: 1 (NR)
Covers leadership skills, such as values and ethics. Also teaches how to influence, how to communicate, how and when to make decisions, how to engage in creative problem solving, and how to plan and organize. Includes a laboratory in applied leadership, common military tasks, and physical fitness.

Prerequisite(s): MLSC 100 and 101, or approval of professor of military science

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

MLSC 201 - Leadership Skills IV

Credits: 1 (NR)
Builds on the leadership skills developed in Leadership Skills III with additional emphasis on communication, team building, and team leadership. Includes a laboratory in applied leadership, common military tasks, and physical fitness.

Prerequisite(s): MLSC 200

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

MLSC 300 - Applied Leadership I

Credits: 0 or 1 (NR)
Applied leadership with an introduction to the principles of physical fitness and healthy lifestyle; counseling as means of subordinate development; problem solving; operational analysis, development, and execution; and methods for preparing and presenting instruction. Students are given an introduction to the Leader Development Program that is used to evaluate their leadership performance and provide students with developmental feedback. Some weekend training required. Includes a laboratory in applied leadership, common military tasks, and physical fitness.

Prerequisite(s): MLSC 100, 101, 200, and 201; and credit or veteran status with approval from military science professor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

MLSC 301 - Applied Leadership II
Credits: 1 (NR)
Applied leadership covering the models of communications (verbal and nonverbal), technology to communicate, how to prepare and conduct formal briefings, an introduction to the Army branches, diversity and equal opportunity training, ethical decision making, and group cohesion and dysfunction. Some weekend training required. Includes a laboratory in applied leadership, common military tasks, and physical fitness.

Prerequisite(s): MLSC 300

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

MLSC 400 - Leadership and Management

Credits: 3 (NR)
Considered the "transition to lieutenant" phase in which managerial theories are applied to personnel, training, and logistics management situations. Students have command and staff responsibilities for the Mason cadet corps and receive hands-on experience operating as a management team. There are several briefing and writing requirements as well. Includes a laboratory in applied science, common military tasks, and physical fitness.

Prerequisite(s): MLSC 300 and 301

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

MLSC 401 - Leadership and Ethics

Credits: 3 (NR)
Continuing the "transition to lieutenant" phase of ROTC, examines ethics of military environment to include customs, ethical codes and decision making, constraints, and appeals to moral principles. American judicial system is also examined, with emphasis on the Uniform Code of Military Justice. Command and staff responsibilities are assigned to students for hands-on experience operating as a management team for Mason cadet corps. Includes a laboratory in applied leadership, common military tasks, and physical fitness.

Prerequisite(s): MLSC 400, 300, or 301

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

Music (MUSI)

Offered by the College of Visual and Performing Arts

All private music instruction is by arrangement. Students must consult the director of applied music studies in the School of Music for teacher assignment and registration numbers. Private music instruction fee applies. Students who register for private music instruction must also register for an ensemble.

For music major, music minor, or jazz studies minor: halfhour lesson per week, 1 credit, $164.50; hour lesson per week, 2 or 3 credits, $329.
MUSI 100 - Fundamentals of Music

Credits: 3 (NR)
Study of musical notation, interval and triad construction, reading of treble and bass clefs, scale construction, rhythm, elementary sight singing and ear training, and application at keyboard.

Fulfills general education requirement in arts.

Notes: Cannot be applied toward degree in music.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MUSI 101 - Introduction to Classical Music

Credits: 3 (NR)
Introduces art-music tradition of West. Techniques for expanding listening skills developed through study of musical elements, styles, and selected masterworks of musical literature.

Fulfills general education requirement in arts.

Notes: Music majors may take only as free elective.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MUSI 102 - Popular Music in America

Credits: 3 (NR)
Investigates popular music styles and development in the United States with particular emphasis on the past 50 years. Lectures, recordings, and video enhance critical listening skills and examine stylistic and social contexts of popular music.

Fulfills general education requirement in arts.

Notes: Music majors may take only as free elective.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MUSI 103 - Musics of the World
Credits: 3 (NR)
Study and comparison of musical structure and expression in several world cultures, with special attention to social context and function. Studies selected Asian, Middle Eastern, African, and American (Latin, Native, African) cultures.

Fulfills general education requirement in global understanding.

Notes: For non-music majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MUSI 104 - Introduction to Twentieth-Century Music

Credits: 3 (NR)
Survey of various styles found in 20th-century music. Tonal, atonal, serial, and experimental music.

Notes: Music majors may take only as free elective.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 105 - Music in the United States

Credits: 3 (NR)
Study of music in the United States from colonial times to present. Through interaction with musical examples, traces significant African and European influences on emerging style and artistic activity in the United States.

Notes: Music majors may take only as free elective.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 107 - The Development of Jazz

Credits: 3 (NR)
Historical, analytical, and aural survey of jazz from inception to present day. Looks at trends resulting from synthesis of jazz with other musical idioms.

Fulfills general education requirement in arts.

Notes: Music majors may take as free elective or part of jazz studies concentration.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
MUSI 113 - Aural Skills I

Credits: 1 (NR)
Students taught to sing a line of music without accompaniment of instrument. Matching tones, major and minor scales, key signatures, intervals, rhythm, treble and bass clefs, and rhythmic and melodic dictation.

Prerequisite(s): Restricted to MUSI majors, MUSI minors, and Jazz Studies minors, or to those with permission of music associate chair.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MUSI 114 - Aural Skills II

Credits: 1 (NR)
Continuation of MUSI 113. Alto and tenor clefs, modulation, various modes, and melodic and harmonic dictation.

Prerequisite(s): MUSI 113, or permission of instructor

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MUSI 115 - Theory I

Credits: 3 (NR)
Music notation, scales, key signatures, intervals, chords, cadences, and figured bass.

Prerequisite(s): Student must be able to read music, be able to pass a fundamentals of music test (administered during first week of classes), and have some proficiency on a musical instrument or in voice. Restricted to MUSI majors; MUSI minors and Jazz Studies minors need permission of music associate chair; non-MUSI majors need permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MUSI 116 - Theory II

Credits: 3 (NR)
First- and second-inversion chords, modulation, nonharmonic tones, figured bass, seventh chords. Analysis of Bach chorales; composition of four-part chorales in 18th-century style.

Prerequisite(s): MUSI 115, or permission of instructor.
MUSI 121 - NonMaj PMI:First Instrum

Credits: 1-2 (RD)
Prerequisite(s): For non-music majors only. Two-credit level restricted to students with substantial prior private study.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

MUSI 122 - NonMaj PMI:Secnd Instrum

Credits: 1-2 (RD)

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

MUSI 171 - Keyboard Skills I

Credits: 1 (NR)
Study of piano keyboard as it relates to various clefs in music. Emphasis on solution of basic stylistic and technical problems.

Prerequisite(s): Restricted to MUSI majors, MUSI minors, and jazz studies minors, or to those with permission of music associate chair.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
When Offered: Fall

MUSI 172 - Keyboard Skills II

Credits: 1 (NR)
Study of piano keyboard as it relates to intermediate song and combined in various music forms.

Prerequisite(s): MUSI 171. Restricted to MUSI majors, MUSI minors, and jazz studies minors, or to those with permission of music associate chair.

Notes: Nonmusic majors must have permission of instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 3
When Offered: Spring
MUSI 213 - Aural Skills III

Credits: 2 (NR)
Continuation of Music 114. Emphasizes modulation, chromatic and nontonal melodies, various modes, melodic and harmonic dictation, c clefs, and improvisation.

Prerequisite(s): Music 114, or permission of instructor.

Corequisite(s): Music 114, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

MUSI 214 - Aural Skills IV

Credits: 2 (NR)
Continuation on MUSI 213 with emphasis on chromatic and non-tonal harmonies.

Prerequisite(s): MUSI 213, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

MUSI 215 - Theory III

Credits: 3 (NR)
Study of four-part chromatic harmony and analysis of 19th-century compositions.

Prerequisite(s): MUSI 116 or permission of instructor. Restricted to music majors; music minors and jazz studies minors need permission of music associate chair; non-music majors need permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MUSI 216 - Theory IV

Credits: 3 (NR)
Study of melodic, harmonic, rhythmic, and formal processes in post-tonal music.

Prerequisite(s): MUSI 215, or permission of instructor.

Hours of Lecture or Seminar per week: 3
MUSI 221 - Applied Music I

Credits: 1 (RD)  
Applied music studies 1.  

Prerequisite(s): Audition or portfolio.  

Notes: May be repeated for up to 8 credits.  

Hours of Lecture or Seminar per week: 1-3  
Hours of Lab or Studio per week: 0.5

MUSI 222 - Applied Music in Keyboard

Credits: 1 (RD)  
Applied music studies in Keyboard.  

Prerequisite(s): Audition.  

Notes: May be repeated for up to 8 credits.  

Hours of Lecture or Seminar per week: 1-3  
Hours of Lab or Studio per week: 0.5

MUSI 223 - Applied Music in Voice

Credits: 1 (RD)  
Applied music studies in Voice.  

Prerequisite(s): Audition.  

Corequisite(s): MUSI 381, 384, or 385.  

Notes: May be repeated for up to 8 credits.  

Hours of Lecture or Seminar per week: 1-3  
Hours of Lab or Studio per week: 0.5

MUSI 224 - Applied Music in Woodwind
Applied music studies in Woodwind.

Prerequisite(s): Audition.

Notes: May be repeated for up to 8 credits.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0.5

MUSI 225 - Applied Music in Brass

Credits: 1 (RD)
Applied music studies in Brass.

Prerequisite(s): Audition.

Notes: May be repeated for up to 8 credits.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0.5

MUSI 226 - Applied Music in String

Credits: 1 (RD)
Applied music studies in String.

Prerequisite(s): Audition.

Notes: May be repeated for up to 8 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0.5

MUSI 227 - Applied Music in Percussion

Credits: 1 (RD)
Applied music studies in Percussion.

Prerequisite(s): Audition.

Notes: May be repeated for up to 8 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0.5
MUSI 228 - Applied Music in Composition

Credits: 1 (RD)
Applied music studies in Composition.

Prerequisite(s): Portfolio of recent compositions.

Notes: May be repeated for up to 8 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 241 - Applied Music II

Credits: 2 (RD)
Applied music studies 2.

Prerequisite(s): Audition or portfolio.

Notes: May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 242 - Applied Music in Keyboard

Credits: 2 (RD)
Applied music studies in Keyboard.

Prerequisite(s): Audition.

Notes: May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 243 - Applied Music in Voice

Credits: 2 (RD)
Applied music studies in Voice.

Prerequisite(s): Audition.

Corequisite(s): MUSI 381, 384, or 385.

Notes: May be repeated for up to 16 credits.
MUSI 244 - Applied Music in Woodwind

Credits: 2 (RD)
Applied music studies in Woodwind.

Prerequisite(s): Audition.

Notes: May be repeated for up to 16 credits.

MUSI 245 - Applied Music in Brass

Credits: 2 (RD)
Applied music studies in Brass.

Prerequisite(s): Audition.

Notes: May be repeated for up to 16 credits.

MUSI 246 - Applied Music in String

Credits: 2 (RD)
Applied music studies in String.

Prerequisite(s): Audition.

Notes: May be repeated for up to 16 credits.

MUSI 247 - Applied Music in Percussion

Credits: 2 (RD)
Applied music studies in Percussion.
Prerequisite(s): Audition.

Notes: May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 248 - Applied Music in Composition

Credits: 2 (RD)
Applied music studies in Composition.

Prerequisite(s): Portfolio of recent compositions.

Notes: May be repeated for up to 16 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 251 - The Art of Teaching Music

Credits: 3 (NR)
Introduces and explores various music teaching professions. Examines philosophical, pedagogical, and practical issues in context of diverse teaching situations and venues that range from private studio and public school to community music schools and commercial establishments.

Fulfills general education requirement in oral communication for the Music BM only.

Prerequisite(s): Admission to music major or minor program, or jazz studies minor program.

Notes: Requires observing professionals in the field.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MUSI 273 - Keyboard Skills III

Credits: 1 (NR)
Continuation of MUSI 172. Study of techniques of harmonization at the piano keyboard.

Prerequisite(s): MUSI 172. Restricted to MUSI majors, MUSI minors, and Jazz Studies minors, or permission of music associate chair.

Notes: Nonmusic majors must have permission of instructor.
MUSI 300 - Recital Attendance

Credits: 0 (RD)
Students attend 10 student recitals to be selected from departmental and music education recitals, and junior, senior, and graduate recitals.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: S/NC
When Offered: Fall, Spring

MUSI 301 - Music in Motion Pictures

Credits: 3 (NR)
Intensive study and analysis of using music tracks in motion pictures to introduce the picture, set a scene, create moods, or for musical numbers. From the silent film scores of the 1920s to the present (including electronic music).

Fulfills general education requirement in arts.

Prerequisite(s): 30 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 302 - American Musical Theater

Credits: 3 (NR)
Intensive study of the musical elements in the American musical theater from its European and later African roots to its evolution between the wars into a native form, and its continual assimilation of external influences such as new forms of jazz and rock to the eclectic form of the present day.

Fulfills general education requirement in arts.

Prerequisite(s): 30 credit hours or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 311 - Jazz Studies
Credits: 3 (NR)
Musicianship course integrating jazz improvisation, theory, composition, and arranging. Focuses on concepts unique to our time in style, form, and harmony.

Prerequisite(s): MUSI 379 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 315 - Music Technology

Credits: 3 (NR)
Study of technology related to music, including audio synthesis and computer-based hardware and software.

Prerequisite(s): MUSI 100 or 115

Notes: There is a course fee beyond tuition charges.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 316 - Topics in Music Technology

Credits: 3 (RD)
Selected topics in music technology with an emphasis on musical creativity. Includes consideration of recent developments in areas such as electronic composition, the science of music, recording industry and practices, and music industry.

Prerequisite(s): MUSI 315

Notes: Can be repeated for up to 9 credits. There is a course fee beyond tuition charges.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 319 - Class Composition and Arranging

Credits: 3 (NR)
Students write original compositions for specified instruments, voices, or combinations. They then apply compositional principles to the creative arrangement of existing music of various styles.

Prerequisite(s): MUSI 114 or 216, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
MUSI 321 - Non-Major PMI

Credits: 1-2 (NR)
Prerequisite(s): 4 credits in Non-Major Private Music Instruction or audition for the PMI coordinator.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

MUSI 323 - Music Education Recital

Credits: 0 (NR)
Recital on major instrument given by student during junior or senior year.

Prerequisite(s): Minimum 8 credits in private music instruction in major instrument
Corequisite(s): Concurrent enrollment in appropriate 2-credit private music instruction course.

Notes: Recital must be at least 25 minutes long. All recitals by arrangement. Students must consult with director of applied music studies to register and schedule dates.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: S/NC

MUSI 324 - Junior Recital

Credits: 1 (NR)
Public recital by student during junior year.

Corequisite(s): Concurrent enrollment in appropriate 3-credit private music instruction course.

Notes: Junior recital must be at least 25 minutes long. All recitals by arrangement. Students must consult with director of applied music studies to register and schedule dates.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 325 - Performance Seminar and Vocal Literature for Singers and Accompanists I

Credits: 2 (RD)
Students assigned vocal literature in Italian, English, German, and French from Baroque to 21st century, and perform in a weekly master class format. Designed for vocal performance and piano and accompanying majors; develops and improves artistic and performance skills, repertoire preparation and execution, diction, interpretation, style, and overall stage presence.

Prerequisite(s): Admission to the Music major program or permission of instructor.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

**MUSI 326 - Performance Seminar and Vocal Literature for Singers and Accompanists II**

Credits: 2 (RD)
Students assigned vocal literature in Italian, English, German, and French from Baroque to 21st century, and perform in a weekly master class format. Designed for vocal performance and piano and accompanying majors; develops and improves artistic and performance skills, repertoire preparation and execution, diction, interpretation, style, and overall stage presence.

**Prerequisite(s):** Admission to the Music major program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

**MUSI 331 - Music History in Society I**

Credits: 3 (NR)
Historical survey of Western music from Greek times through the late Baroque era, with emphasis on specific musical genres and composers who developed them. Musical developments are related to other aspects of society. Instruction conducted by lectures, recordings, and video. Learning process enhanced by reading, listening, writing, and analytical assignments.

**Prerequisite(s):** MUSI 215 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**MUSI 332 - Music History in Society II**

Credits: 3 (NR)
Historical survey of Western music from the early Classical era through mid-19th century, with emphasis on specific musical genres and composers who developed them. Musical developments related to other aspects of society. Lectures, recordings, video. Learning process enhanced by reading, listening, writing, and analytical assignments.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** MUSI 216 and 331, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

**MUSI 341 - Diction for Singers I: Italian Diction and English Diction**
Credits: 2 (NR)
Increases proficiency in singing in Italian and English by teaching International Phonetic Alphabet (IPA), and strengthens performance of Italian and English art songs and operatic repertoire. Focuses on intensified, systematic study of phonetics as it applies to singing in Italian and English.

Prerequisite(s): Admission to the Music major program or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

MUSI 342 - Diction for Singers II: German Diction and French Diction

Credits: 2 (NR)
Increases proficiency in singing in German and French by teaching International Phonetic Alphabet (IPA), and strengthens performance of German and French art songs and operatic repertoire. Focuses on intensified, systematic study of phonetics as it applies to singing in German and French.

Prerequisite(s): Restricted to MUSI majors and minors. Non majors need permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

MUSI 351 - Keyboard Pedagogy

Credits: 3 (NR)
Investigates methods, theories, techniques, and materials to teach keyboard to children and adults in individual and group situations.

Prerequisite(s): MUSI 114, 216 and 273; and 8 credits in piano, organ, or harpsichord; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer

MUSI 352 - Vocal Pedagogy and Lab

Credits: 3 (NR)
Instruction in teaching of voice through systematic study of vocal physiology and its implications for pedagogical methods. Includes theoretical and systematic study of processes, procedures, and practices to develop art of singing. Offers technical, physiological, theoretical, and practical principals of the singing art, with emphasis on the importance of vocal health.

Prerequisite(s): Admission to the Music major program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
MUSI 353 - Instrumental Pedagogy and Literature

Credits: 3 (NR)
Instruction in teaching instrumental music techniques for all levels through study of pedagogical methods, standard literature, and musical instruments produced by present-day manufacturers.

Prerequisite(s): Junior standing in instrumental private music instruction, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 361 - Class Strings: Violin, Viola, Cello, and Bass

Credits: 1 (NR)
Study of playing and teaching string instruments with emphasis on violin and cello through beginning method book. Study of fingerings and bowing techniques to teach and play viola and bass at beginning levels. Survey of string playing techniques to conduct rehearsals at intermediate-, advanced-, and artist-level ensembles.

Prerequisite(s): Admission to music major program, or permission of instructor.

Notes: Three hours per week studying violin, viola, cello, and bass; one hour per week in laboratory ensemble.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 363 - Class Woodwinds: Flute, Clarinet, Saxophone

Credits: 1 (RD)
Study of techniques of playing and teaching flute and clarinet. Survey of instructional materials, and mouthpiece and instrument selection.

Prerequisite(s): Admission to music major program, or permission of instructor.

Notes: Three hours per week studying flute and clarinet; one hour per week in laboratory ensemble.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 364 - Class Woodwinds: Oboe and Bassoon

Credits: 1 (RD)
Study of techniques of playing and teaching oboe and bassoon. Survey of instructional materials, instrument selection, and reed adjustment.

Prerequisite(s): Admission to music major program, or permission of instructor.
Notes: Three hours per week studying oboe and bassoon; one hour per week in laboratory ensemble.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 365 - Class Brass: Trumpet and French Horn

Credits: 1 (NR)
Study of techniques of playing and teaching trumpet and French horn. Survey of instructional materials, and mouthpiece and instrument selection.

Prerequisite(s): Admission to music major program, or permission of instructor.

Notes: Three hours per week studying trumpet and French horn; one hour per week in laboratory ensemble.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 366 - Class Percussion

Credits: 1 (NR)
Study of techniques of playing and teaching percussion instruments. Survey of instructional materials and instrument selection.

Prerequisite(s): Admission to music major program, or permission of instructor.

Notes: Three hours per week studying percussion instruments; one hour per week in laboratory ensemble.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 367 - Class Guitar

Credits: 1 (NR)
Study of techniques of playing and teaching guitar. Survey of instructional materials and instrument selection.

Prerequisite(s): Admission to music major program, or permission of instructor.

Notes: Three hours per week studying guitar; one hour per week in laboratory ensemble.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 368 - Class Voice
Credits: 1 (NR)
Study of the human voice in artistic singing. Emphasizes practical application of basic principles.

Prerequisite(s): Admission to music major program, or permission of instructor.

Notes: Three hours per week studying voice; one hour per week in laboratory ensemble.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 369 - Class Brass: Trombone, Euphonium, and Tuba
Credits: 1 (NR)
Study of techniques of playing and teaching trombone, euphonium, and tuba. Survey of instructional materials and mouthpiece and instrument selection.

Prerequisite(s): Admission to music major program, or permission of instructor.

Notes: Three hours per week studying trombone, euphonium, or tuba; one hour per week in laboratory ensemble.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 4

MUSI 371 - Techniques of Accompanying I
Credits: 1 (NR)
Development of accompanying skills through collaboration with solo singers, instrumentalists, and small ensembles. Students perform for each other; observe lectures, demonstrations, and performances by professionals; and participate in master classes.

Prerequisite(s): Restricted to piano majors and minors, or to those with permission of instructor.

Notes: May be taken two times for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

MUSI 372 - Techniques of Accompanying II
Credits: 1 (NR)
Development of accompanying skills through collaboration with solo singers, instrumentalists, and small ensembles. Students perform for each other; observe lectures, demonstrations, and performances by professionals; and participate in master classes.

Prerequisite(s): MUSI 371. Audition on a keyboard instrument for admission to a music degree program, 4 credits in undergraduate Private Music Instruction on a keyboard instrument, or permission of instructor.

Notes: May be taken two times for credit.
MUSI 373 - Advanced Accompanying and Musicianship Skills

Credits: 3 (NR)
Advanced study and techniques for accompanying choirs, vocal soloists, and instrumentalists. Additional instruction in keyboard reduction of orchestral scores for concertos, continuo/figured bass reading, lead-sheet reading, transposition, improvisation, transcription, and "playing by ear."

Prerequisite(s): MUSI 372 or permission of instructor.

Corequisite(s): MUSI 372 or permission of instructor.

MUSI 379 - Introduction to Jazz Improvisation

Credits: 1 (NR)
Study of improvisation techniques and styles, with emphasis on common practice period of jazz. Application on the student's major instrument or voice to develop creativity and personal expression.

Prerequisite(s): MUSI 116 or permission of instructor; corequisite for Jazz Studies minors: MUSI 485 (Jazz Chamber Ensembles).

MUSI 380 - Wind Symphony

Credits: 1 (RD)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights find expression via performance. Highly selective group of instrumentalists perform works from wind symphony repertoire.

Fulfills general education requirement in arts.

Prerequisite(s): Audition.

Notes: Public concerts required.
MUSI 381 - University Chorale

Credits: 1 (RT)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights find expression via performance. Performance of works from choral repertoire.

Fulfills general education requirement in arts.

Prerequisite(s): Audition.

Notes: Public concerts required.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

MUSI 382 - Piano Ensemble

Credits: 1 (RT)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights find expression via performance. Study and performance of original four-hand works for one and two pianos.

Fulfills general education requirement in arts.

Prerequisite(s): 4 hours of PMI (Piano) and audition. Written Permission of Instructor required.

Notes: Public performances required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

MUSI 383 - Symphonic Band

Credits: 1 (RT)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights find expression via performance. Performance of works from band repertoire.

Fulfills general education requirement in arts.

Prerequisite(s): Audition.

Notes: Public concerts required.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring
MUSI 384 - Symphonic Chorus

Credits: 1 (RT)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights find expression via performance. Performance of major works from the choral repertoire.

Fulfills general education requirement in arts.

Prerequisite(s): Audition.

Notes: Public concerts are given.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

MUSI 385 - Chamber Singers

Credits: 1 (RT)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights find expression via performance. Students explore their levels of artistic development through discovery, interpretation, and performance of choral music for vocal chamber music ensembles from multiple historical periods. Students bring to Mason and surrounding community musical compositions not readily accessible in regular concert repertoire.

Fulfills general education requirement in arts.

Prerequisite(s): Audition.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

MUSI 387 - Symphony Orchestra

Credits: 1 (RT)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights find expression via performance. Performance of works from symphony orchestra repertoire.

Fulfills general education requirement in arts.

Prerequisite(s): Audition.

Notes: Public concerts required.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring
MUSI 388 - Fundamental Techniques of Stagecraft for Opera and Music Theater

Credits: 2 (NR)
Study of basic to intermediate stage movement techniques necessary to the performance of opera and music theater roles. Emphasis on acting, improvisation, theater production, musical theater, and operatic role study.

Prerequisite(s): Admission to music program, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

MUSI 389 - Jazz Ensemble

Credits: 1 (RT)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights find expression via performance. Provides practical experience in various aspects of jazz performance: section work within a large aggregation, combo work, and improvisation.

Fulfills general education requirement in arts.

Prerequisite(s): Audition.

Notes: Public concerts required.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

MUSI 391 - Conducting I

Credits: 2 (NR)
Study of basic techniques of conducting a musical ensemble.

Prerequisite(s): MUSI 114, 216, and 273; or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 3
When Offered: Fall

MUSI 393 - Music Administration and Management

Credits: 2 (NR)
Prepares students to address aspects of administration and management of music programs in public and private schools. Investigates principles and concepts of management styles and planning. Covers curriculum, budget, student recruitment and
retention, external relations of the music unit, and legal issues for music educators.

**Prerequisite(s):** MUSI 116, or permission of instructor.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**MUSI 395 - Teaching Internship**

Credits: 1-4 (RT)  
Internship with a professional individual or organization in teaching. Introduction to teaching or augmentation of teaching skills. Students develop individual contracts defining the learning and competencies to be gained from the experience.

**Prerequisite(s):** MUSI 251.

**Notes:** Maximum of 9 internship credits (MUSI 395, 495, 496) can be applied toward a degree.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**MUSI 396 - Conducting II**

Credits: 2 (NR)  
Advanced conducting course emphasizing techniques for instrumental and choral conducting. Refining gestures, full score analysis and interpretation, rehearsal techniques, and changing meters.

**Prerequisite(s):** MUSI 391, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

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**MUSI 401 - Impact of the Arts on Civilization**

Credits: 3 (NR)  
Analyzes how genres of art impact us intellectually, emotionally, and subliminally. Broadens aesthetic and historical perspective, exposes students to major strands of contemporary thought, and develops discursive abilities through role-playing in round table discussions.

**Prerequisite(s):** 30 credits, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
MUSI 415 - Music in Computer Technology

Credits: 3 (NR)
Overview of ways computer is used in music. Topics include principles of musical instrument digital interface (MIDI); various kinds of synthesis; acoustics and sound processing; and musical composition using the computer. Explores music resources of Internet and surveys current multimedia applications in music history, theory, ear training, improvisation, and notation.

Fulfills general education requirement in information technology (all).

Prerequisite(s): MUSI 319, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1
When Offered: Spring

MUSI 419 - Orchestration

Credits: 3 (NR)
Principles of combining and balancing instruments in orchestral and chamber contexts. Attention to orchestral terminology and general notation as well as timbre, range, clefs, transposition, special effects, and scoring procedures.

Prerequisite(s): MUSI 114, 216, and 319; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MUSI 421 - Applied Music III

Credits: 1 (RD)
Applied music studies 3.

Prerequisite(s): Audition or portfolio of recent compositions.

Notes: May be repeated for up to 8 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 424 - Senior Recital

Credits: 1 (NR)
Public recital by student during senior year.

Corequisite(s): Concurrent enrollment in appropriate 3-credit private music instruction course.
Notes: Senior recital must be at least 50 minutes long. All recitals by arrangement. Students must consult with director of applied music studies to register and schedule dates.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 431 - Music History in Society III

Credits: 3 (NR)
Studies contributions to the world of music in selected cultures such as India, Indonesia, China, Japan, Africa, Middle East, and Americas. Emphasizes comparative musical characteristics as well as sociological function. Lectures, recordings, and video. Learning process enhanced by reading, listening, writing, and analytical assignments.

Fulfills general education requirement in global understanding.

Prerequisite(s): MUSI 216, 331, and 332; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

MUSI 432 - Music History in Society IV

Credits: 3 (NR)
Historical survey of Western music from late 19th century to present, with emphasis on specific musical genres and composers who developed them. Relates musical developments to other aspects of society, and considers interaction between world music. Lectures, recordings, and video. Learning process enhanced by reading, listening, writing, and analytical assignments.

Prerequisite(s): MUSI 216, 331, 332, and 431; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MUSI 441 - Private Music Instruction IV

Credits: 2-3 (RD)
Applied music studies 4.

Prerequisite(s): Audition or portfolio of recent compositions.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
MUSI 442 - Applied Music in Keyboard

Credits: 2-3 (RD)
Applied music studies in Keyboard.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 443 - Applied Music in Voice

Credits: 2-3 (RD)
Applied music studies in Voice.

Prerequisite(s): Audition.

Corequisite(s): MUSI 381, 384, or 385.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 444 - Applied Music in Woodwind

Credits: 2-3 (RD)
Applied music studies in Woodwind.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 445 - Applied Music in Brass

Credits: 2-3 (RD)
Applied music studies in Brass.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.
MUSI 446 - Applied Music in String

Credits: 2-3 (RD)
Applied music studies in String.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

MUSI 447 - Applied Music in Percussion

Credits: 2-3 (RD)
Applied music studies in Percussion.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

MUSI 448 - Applied Music in Composition

Credits: 2-3 (RD)
Applied music studies in Composition.

Prerequisite(s): Portfolio of recent compositions.

Notes: May be repeated for up to 18 credits.

MUSI 450 - Jazz Improvisation I

Credits: 2 (NR)
Emphasizes improvisational materials and language developed in common practice period of jazz.
MUSI 451 - Keyboard Pedagogy II

Credits: 3 (NR)
Intensive study of methods, theories, techniques, and materials to teach keyboard to children and adults in individual and group situations.

Prerequisite(s): MUSI 351 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 452 - Jazz Improvisation II

Credits: 2 (NR)
Emphasis on advanced improvisational techniques and contemporary tunes.

Prerequisite(s): MUSI 399 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

MUSI 454 - Jazz Arranging

Credits: 3 (NR)
Transcription, analysis, and scoring for small and large jazz ensembles.

Prerequisite(s): MUSI 311 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 461 - The Teaching of General Music in the Elementary and Middle School

Credits: 3 (NR)
Studies theory, methods, practice, and materials to teach general music in elementary and middle school. Students spend three hours per week in class and one hour per week observing and teaching in laboratory ensemble. Students also participate in field observation of music classes in the public schools.
Prerequisite(s): MUSI 114, 216, 273; and acceptance into music education concentration.

Corequisite(s): MUSI 391

Notes: For music majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Fall

MUSI 463 - The Teaching of Vocal Music in the Secondary School

Credits: 3 (NR)
Survey of repertoire and methods for teaching high school choral groups, small ensembles, and voice classes. Students spend three hours per week in class, and one hour per week observing and teaching in laboratory ensemble. Students also participate in field observation of music classes in public schools.

Prerequisite(s): MUSI 114, 216, 273, and 391; and acceptance into music education concentration.

Corequisite(s): MUSI 396.

Notes: For music majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Spring

MUSI 464 - Instrumental Music Methods I

Credits: 3 (NR)
Prepares students to successfully plan, organize, and administer marching band and jazz ensemble programs in secondary public school music curriculum. Students spend three hours per week in class, and one hour per week observing and teaching in laboratory ensemble. Students also participate in field observation of music classes in public schools.

Prerequisite(s): MUSI 114, 216, and 273; and acceptance into music education concentration.

Corequisite(s): MUSI 391

Notes: For music majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Fall

MUSI 465 - Selected Topics in Music Education
Credits: 1-3 (RD)
Topics of practical interest to prospective and practicing music educators covering pedagogy, performance, and logistics of teaching music in schools, private studios, and communities.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

MUSI 466 - Instrumental Music Methods II

Credits: 3 (NR)
Prepares students to teach instrumental music in elementary, middle, and secondary schools. Students spend three hours per week in class, and one hour per week observing and teaching in laboratory ensemble. Students also participate in field observation of music classes in public schools.

Prerequisite(s): MUSI 114, 216, 273, and 391; and acceptance to music education concentration.

Corequisite(s): MUSI 396.

Notes: For music majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Spring

MUSI 467 - Instrumental Music Methods I: Orchestra

Credits: 3 (NR)
Prepares students to successfully plan, organize, and administer string classes from the beginning levels through performing ensembles (grades 4-12), and explore teaching materials appropriate for individual and class instruction. Students spend three hours per week in class, and one hour per week observing and teaching in laboratory ensemble. Students also participate in field observation of music classes in public schools.

Prerequisite(s): MUSI 114, 216, 273, and 361; and acceptance into music education concentration.

Corequisite(s): MUSI 391

Notes: For music majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 485 - Chamber Ensembles

Credits: 1 (RT)
Students develop an understanding of major artistic works, including a consideration of how theoretical and historical insights
find expression via performance. Performance of works from chamber music repertoire.

Fulfills general education requirement in arts.

Prerequisite(s): Audition.

Notes: Public performances required.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring

**MUSI 490 - Musical Communication in Context**

Credits: 3 (NR)
Explains nature of musical communication in a variety of contexts, and combines knowledge gained in general education courses with knowledge and skills specific to the major to serve as a capstone course synthesizing both areas. How does music itself communicate, and how do musicians communicate about it with each other and with the world around them? Students address these through essays in the style of a journal or portfolio, substantial paper, and oral presentation of paper before faculty and student panel.

Fulfills general education requirement in synthesis.

Prerequisite(s): Must be in senior year of the B.A. program in Music and have completed all other general education requirements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**MUSI 491 - Musical Communication in Performance**

Credits: 1 (NR)
 Helps student conceive of musical performance as communication in a variety of contexts, and combines knowledge in general education courses with knowledge and skills specific to the major to serve as a capstone course synthesizing both areas. Students consider various aspects of musical communication to prepare senior recital. Students explore social, historical, analytical, and aesthetic aspects of the music they are to perform by composing essays in the style of a journal or portfolio. Students prepare a substantial paper on recital repertoire and present that paper before a faculty and student panel.

Prerequisite(s): Completion of all other required general education courses for BM performance concentration.

Corequisite(s): Concurrent enrollment in appropriate 3-credit private music instruction course and Music 424.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**MUSI 492 - Selected Topics in Music**
Topics of practical interest to students in composition, music history and literature, world music, jazz studies, and performance practices.

Prerequisite(s): 45 credits, or permission of instructor.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

**MUSI 492H - Selected Topics in Music**

Credits: 1-3 (NR)
Topics of practical interest to students in music history course.

Prerequisite(s): MUSI 331 and 332 or Permission of Instructor. 90 hours in a music degree program or Permission of Instructor.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

**MUSI 492J - Selected Topics in Music**

Credits: 1-3
Topics of practical interest to students in jazz studies course.

Prerequisite(s): 45 credits, or permission of instructor.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

**MUSI 492N - Selected Topics in Music**

Credits: 1-3 (NR)
Topics of practical interest to students in non-Western music course.

Prerequisite(s): This course meets non-western course requirements.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
MUSI 495 - Internship in Music Education: Student Teaching

Credits: 6-12 (NR)
Full semester of intensive student teaching experience in approved Virginia schools.

Prerequisite(s): Completion of all other courses required for BM with concentration in music education.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

MUSI 496 - Internship

Credits: 2-6 (NR)
Contact the department one semester before enrollment. Internships are approved work-study programs with specific employers or agencies.

Prerequisite(s): Open to music majors with 90 credits.

Notes: Credit is determined by the department. Maximum 9 internship credits (MUSI 395, 495, 496) can be applied toward degree.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 497 - Independent Study

Credits: 1-3 (NR)
Individual research and study of selected subject in close consultation with instructor. Student may choose from the musicological, ethnomusicological, theoretical, compositional, or educational areas, and produce at least one major written work based on research.

Prerequisite(s): Music majors with 90 credits, and permission of instructor and department chair.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 498 - Independent Study

Credits: 1-3 (NR)
Individual research and study of selected subject in close consultation with instructor. Student may choose from the musicological, ethnomusicological, theoretical, compositional, or educational areas, and produce at least one major written work based on research.

Prerequisite(s): Music majors with 90 credits, and permission of instructor and department chair.
MUSI 501 - Graduate Theory Review

Credits: 3 (NR)
Vocabulary and conceptual review of diatonic and chromatic harmony, part writing, form, harmonization, 20th-century techniques.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: Does not count toward required credits of a graduate music degree.

MUSI 502 - Graduate Aural Skills Review

Credits: 3 (NR)
Music reading and aural skills including intervals, dictation (melodic and harmonic), scales, chords, rhythms, and meter.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: Does not count toward required credits of a graduate music degree.

MUSI 515 - Music in Computer Technology

Credits: 3 (NR)
Overview computer use in music. Topics include principles of musical instrument digital interface (MIDI); synthesis; acoustics and sound processing; and musical composition using the computer. Explores music resources of Internet, and surveys multimedia applications in music history, theory, ear training, improvisation, and notation.

Prerequisite(s): Baccalaureate degree in music, or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1
When Offered: Spring

MUSI 516 - Keyboard Skills
Credits: 3 (NR)
Enhance keyboard skills for the non-keyboard major, including technique, harmonization, transposition, reading, and accompanying.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 517 - Score Reading Skills

Credits: 3 (NR)
Enhance score study and score reading skills for the conductor.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 4

MUSI 525 - Performance Seminar and Vocal Literature for Singers and Accompanists I

Credits: 2 (NR)
Students assigned art songs or operatic arias in Italian, German, French, and English, from Baroque to 21st century, and perform in weekly master class format. Develops and improves musical and artistic preparation and performance, increases repertoire, and establishes dependable methods for creating consistently high standards of artistic performance.

Prerequisite(s): Audition.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 526 - Performance Seminar and Vocal Literature for Singers and Accompanists II

Credits: 2 (NR)
Students assigned art songs or operatic arias in Italian, German, French, and English, from Baroque to 21st century, and perform in weekly master class format. Develops and improves musical and artistic preparation and performance, increases repertoire, and establishes dependable methods for creating consistently high standards of artistic performance.

Prerequisite(s): Audition.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 532 - Music History Review I
Credits: 3 (NR)
Enhance understanding of music history and the context of musical style, chronologically through the mid-18th century.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: Does not fulfill courses requirements for graduate degrees in music.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 533 - Music History Review II

Credits: 3 (NR)
Enhance understanding of music history and the context of musical style, from the mid-18th century to today.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: Does not fulfill course requirements for graduate music degrees.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 541 - Diction for Singers I: Italian Diction and English Diction

Credits: 2 (NR)
Increases proficiency in singing in Italian and English by teaching International Phonetic Alphabet (IPA), and strengthens performance of Italian and English art song and operatic repertoire. Intensified, systematic study of phonetics as it applies to Italian and English.

Prerequisite(s): Graduate status in applied voice or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

MUSI 542 - Diction for Singers II: German Diction and French Diction

Credits: 2 (NR)
Increases proficiency in singing in German and French by teaching International Phonetic Alphabet (IPA), and strengthens performance of German and French art songs and operatic repertoire. Intensified, systematic study of phonetics as it applies to singing in German and French.

Prerequisite(s): Graduate status in applied voice or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1
MUSI 551 - Keyboard Pedagogy I

Credits: 3 (NR)
Intensive study of methods, theories, techniques, and materials to teach keyboard to children and adults in individual and group situations.

Prerequisite(s): Graduate status in applied piano, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 552 - Vocal Pedagogy and Lab

Credits: 3 (NR)
Instruction in teaching voice through systematic study of vocal physiology and its implications for pedagogical methods. Includes theoretical and systematic study of processes, procedures, and practices to develop art of singing. Offers technical, physiological, theoretical, and practical principals of the singing art, with emphasis on vocal health.

Prerequisite(s): Graduate status in applied voice or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 553 - Instrumental Pedagogy and Literature

Credits: 3 (NR)
Instruction in teaching of instrumental music techniques for all levels through the study of pedagogical methods, standard literature, and musical instruments produced by present-day manufacturers.

Prerequisite(s): Baccalaureate degree in music, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

MUSI 555 - Music as a Healing Art

Credits: 3 (NR)
Study of the relationship between musical vibrations and the natural rhythms of the body. Topics include history of music and healing, theory of sound, cymatics, toning, and performance practice as well as a survey of vibrational healing modalities and related therapies. Considers listening examples as they apply to healing with music. Students sing and play instruments in directed improvisatory performance.

Prerequisite(s): Basic proficiency with instrument or voice, and bachelor's degree in music.
MUSI 563 - Orff Schulwerk I

Credits: 3 (NR)
Intensive introduction to Orff teaching philosophy with practical and theoretical instruction and immersion in the method itself. Students learn concepts of rhythm, harmony, solfege, modes, improvisation, and pedagogy. Students learn basic performance technique on soprano recorder, and learn to apply movement and dance in their teaching.

MUSI 564 - Orff Schulwerk II

Credits: 3 (NR)
Continues intensive study of Orff teaching philosophy with practical and theoretical instruction and immersion. Teaches further concepts of rhythm and meter including asymmetrical patterns. Reviews pentatonic modes and their transpositions, studies pentachordal and hexachordal scales, and begins intensive work with diatonic modes. Students work with a variety of percussion instruments including body percussion, unpitched instruments, and barred instruments. They sing and play soprano, alto, tenor, and bass recorders. Movement studies continue with intensive study of vocabulary of dance and mime.

Prerequisite(s): MUSI 563, or permission of instructor.

MUSI 565 - Orff Schulwerk III

Credits: 3 (NR)
Continues intensive study of Orff teaching philosophy to complete certification process in Orff Schulwerk. Students continue intensive work in rhythm, melody, harmony, timbre, form, and pedagogy. Tenor, bass, and soprano recorders introduced. Movement and rhythmic studies concentrate on mixed meters and non-Western source materials and styles.

Prerequisite(s): MUSI 563 and 564, or permission of instructor.

MUSI 571 - Techniques of Accompanying I

Credits: 1 (NR)
Development of accompanying skills through collaboration with solo singers, instrumentalists, and small ensembles. Students perform for each other; observe lectures, demonstrations and performances by professionals; and participate in master classes.
Prerequisite(s): Admission to graduate-level private music instruction in keyboard instrument, or permission of instructor.

Notes: Each course may be taken two times for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

MUSI 572 - Techniques of Accompanying II

Credits: 1 (NR)
Development of accompanying skills through collaboration with solo singers, instrumentalists, and small ensembles. Students perform for each other; observe lectures, demonstrations and performances by professionals; and participate in master classes.

Prerequisite(s): Admission to graduate-level private music instruction in keyboard instrument, or permission of instructor.

Notes: Each course may be taken two times for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring, Summer

MUSI 573 - Accompanying and Musicianship III

Credits: 3 (NR)
For piano majors or students with significant keyboard skills.

Prerequisite(s): MUSI 572. Study of complex accompanying skills including open score reading and orchestral reduction.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 592 - Topics in Music

Credits: 1-6 (RT)
Intensive study of selected topics in performance, composition, or conducting. Individual research, group discussions, and participation in related activities.

Prerequisite(s): Baccalaureate degree in music.

Notes: May be repeated for up to 12 credits as topics change.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
MUSI 610 - Topics in Music Theory

Credits: 3 (RD)
Uses music analytical theories to examine repertoire from a given time period or style.

Prerequisite(s): MUSI 501, 502, and 516, or appropriate score on the graduate placement examination.

Notes: May be repeated for up to 9 credits as topics change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 611 - Analytical Techniques

Credits: 3 (NR)
Detailed formal and stylistic examination of music selected from the major style periods. Development of graduate-level analytical skills.

Prerequisite(s): MUSI 501, 502, and 516, or appropriate score on the graduate placement examination.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 613 - Graduate Orchestration

Credits: 3 (NR)
Intensive study of instrumentation through analysis and arrangement. Includes contemporary techniques and scoring for large forces.

Prerequisite(s): MUSI 501, 502, and 516, or appropriate score on the graduate placement examination.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 614 - Music Theory Pedagogy

Credits: 3 (NR)
Study of materials and procedures in the teaching of undergraduate-level music theory subjects.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
MUSI 615 - Advanced Jazz Improvisation

Credits: 3 (NR)
Advanced techniques and applications of jazz improvisation.

Prerequisite(s): Graduate placement exam or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

MUSI 621 - Graduate Applied Music

Credits: 1 (RD)
Graduate Applied music studies

Prerequisite(s): Audition or portfolio.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 622 - Applied Music in Keyboard

Credits: 1 (RD)
Applied music studies in Keyboard.

Prerequisite(s): Audition.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 623 - Applied Music in Voice

Credits: 1 (RD)
Applied music studies in Voice.

Prerequisite(s): Audition.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5
MUSI 624 - Applied Music in Woodwind

Credits: 1 (RD)
Applied music studies in Woodwind.

Prerequisite(s): Audition.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 625 - Applied Music in Brass

Credits: 1 (RD)
Applied Music studies in Brass.

Prerequisite(s): Audition.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 626 - Applied Music in String

Credits: 1 (RD)
Applied Music studies in String.

Prerequisite(s): Audition.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 627 - Applied Music in Percussion

Credits: 1 (RD)
Applied Music studies in Percussion.

Prerequisite(s): Audition.

Notes: May be repeated for up to 6 credits.
Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0.5

MUSI 628 - Applied Music in Composition

Credits: 1 (RD)
Applied Music studies in Composition.

Prerequisite(s): Portfolio of recent compositions.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 629 - Applied Music in Conducting

Credits: 1 (RD)
Applied Music studies in Conducting.

Prerequisite(s): Audition.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0.5

MUSI 630 - Topics in Music History and Literature

Credits: 3 (RD)
Examination of a musical style, genre, composer, compositional school, or historical development. Primary and secondary source materials studied in historical and analytical contexts.

Prerequisite(s): MUSI 532 and 533, or appropriate score on the graduate placement exam.

Notes: Repeatable for up to 9 credits as topics change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 640 - Topics in World Musics
Credits: 3 (RD)
Study of musics from selected cultures. Students will study structural, social, and cognitive foundations of the music.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: Repeatable for up to 9 credits as topics change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 650 - Topics in Jazz Studies

Credits: 3 (RD)
Study of selected topics in performance, composition, arranging and analysis. May be repeated for up to 9 credits as topics change.

Prerequisite(s): Graduate placement exam or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 654 - Graduate Conducting

Credits: 3 (RD)
Classroom study of conducting, including refining gestures, rehearsal leadership, and the communication of musical style.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: May be repeated for up to 9 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 660 - Topics in Music Education

Credits: 1-6 (RT)
Examination of specific areas of concern to music educators. Individual research, group discussions, and participation in related activities.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: Repeatable for up to 9 credits as topics change.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
MUSI 661 - Psychology of Music Teaching and Learning

Credits: 3 (NR)
Study of the learner's musical behaviors (affective, cognitive, and psychomotor) in an effort to devise an empirically based teaching method founded on learning principles.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 662 - Introduction to Research in Music

Credits: 3 (NR)
Development of skills, attitudes, and understanding to conduct and report research in music, including philosophical bases, scope and organization, stylistic practices in writing research reports, study of materials and resources in music and music education, and proper use of library and other research services.

Prerequisite(s): Baccalaureate degree in music, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

MUSI 663 - Aesthetics of Music Education

Credits: 3 (NR)
Study of philosophical foundations of contemporary music education, and critical examination of music programs and activities in aesthetic education and efforts by music education establishment to enhance them.

Prerequisite(s): Baccalaureate degree in music, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 681 - Graduate Choral Ensembles

Credits: 1 (RD)
Performance of works from the choral repertoire.

Prerequisite(s): Audition.

Notes: Public concerts are given. May be repeated for up to 6 credits total.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3
MUSI 682 - Wind Symphony

Credits: 1 (RD)
Highly selective group of instrumentalists performing works from the wind repertoire.

Prerequisite(s): Audition.

Notes: Public concerts are given. May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

MUSI 683 - Symphonic Band

Credits: 1 (RD)
Performance of works from band repertoire.

Prerequisite(s): Audition.

Notes: Public concerts are given. May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

MUSI 685 - Graduate Chamber Ensemble

Credits: 1 (RD)
Performance of works from chamber music repertoire.

Prerequisite(s): Audition.

Notes: Public concerts are given. May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

MUSI 687 - Symphony Orchestra

Credits: 1 (RD)
Performance of works from orchestral repertoire.

Prerequisite(s): Audition.

Notes: Public concerts are given. May be repeated for up to 6 credits.
MUSI 688 - Opera and Musical Theater Ensemble

Credits: 3 (RD)
Solo-vocal, performance-oriented ensemble class that presents operatic works or excerpts from them, from Baroque to 21st century, as well as works or excerpts from American musical theater.

Prerequisite(s): Audition.

Notes: May be repeated for up to 12 credits.

MUSI 689 - Jazz Ensemble

Credits: 1 (RD)
Provides practical experience in aspects of jazz performance. Participation in section rehearsals and small and large jazz groups. Jazz improvisation expected.

Prerequisite(s): Audition.

Notes: Public concerts given. May be repeated for up to 6 credits total.

MUSI 690 - Graduate Lecture Recital

Credits: 1-3 (RD)
Combination of musical performance and scholarly presentation on a well-defined topic.

Prerequisite(s): Baccalaureate degree in music, audition.

Corequisite(s): MUSI 621 (3-credit level).

Notes: Public presentation required. May be repeated for a maximum of 6 credits.

MUSI 695 - Teaching Internship
Teaching beginner, intermediate, and early advanced students in private or group lessons under faculty supervision.

**Prerequisite(s):** MUSI 660.

**Notes:** May be repeated for up to 4 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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### MUSI 699 - Independent Study

Credits: 1-3 (RT)  
Individual research and study a concentration available in the master of music.

**Prerequisite(s):** Baccalaureate degree in music and permission of graduate coordinator.

**Notes:** May be taken for maximum 6 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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### MUSI 710 - Advanced Topics in Music Theory

Credits: 3 (RD)  
Advanced study of specific styles and repertoire from the perspective of various analytical approaches.

**Prerequisite(s):** MUSI 501, 502, and 516, or appropriate score on the graduate placement exam.

**Notes:** May be repeated for up to 9 credits total as topics change.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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### MUSI 712 - Composition for Conductors and Performers

Credits: 3 (NR)  
Advanced study of new music for various media.

**Prerequisite(s):** Undergraduate degree in music, graduate placement exam.

**Notes:** This course is not for students in the composition concentration.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
**MUSI 720 - Advanced Topics in Applied Music**

Credits: 3 (RD)
Advanced study of concepts in applied music.

**Prerequisite(s):** Baccalaureate degree in music, graduate placement exam.

**Notes:** May be repeated for up to 6 credits total as topics change.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**MUSI 721 - Applied Music**

Credits: 2-3 (RD)
Applied Music studies.

**Prerequisite(s):** Audition or portfolio.

**Notes:** May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1

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**MUSI 722 - Applied Music in Keyboard**

Credits: 2-3 (RD)
Applied music studies in Keyboard.

**Prerequisite(s):** Audition.

**Notes:** May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1

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**MUSI 723 - Applied Music in Voice**

Credits: 2-3 (RD)
Applied music in Voice.

**Prerequisite(s):** Audition.

**Notes:** May be repeated for up to 18 credits.
MUSI 724 - Applied Music in Woodwind

Credits: 2-3 (RD)
Applied music studies in Woodwind.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

MUSI 725 - Applied Music in Brass

Credits: 2-3 (RD)
Applied music studies in Brass.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

MUSI 726 - Applied Music in String

Credits: 2-3 (RD)
Applied music studies in String.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

MUSI 727 - Applied Music in Percussion

Credits: 2-3 (RD)
Applied music studies in Percussion.
Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 728 - Applied Music in Composition

Credits: 2-3 (RD)
Applied music studies in Composition.

Prerequisite(s): Portfolio of recent compositions.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

MUSI 729 - Applied Music in Conducting

Credits: 2-3 (RD)
Applied music studies in Conducting.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1

MUSI 730 - Advanced Topics in Music History

Credits: 3 (RT)
Advanced study of specific genres, composers, or repertoire from a historically analytical perspective.

Prerequisite(s): MUSI 532 and 533, or appropriate score on the graduate placement exam.

Notes: May be repeated for up to 9 credits total as topics change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 760 - Advanced Topics in Music Education
Credits: 3 (RD)
Advanced study of selected issues in music education.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: May be repeated for up to 9 credits total as topics change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 770 - Advanced Topics in Pedagogy

Credits: 3 (RD)
Advanced study of a specific topic in the pedagogy of music.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: May be repeated for up to 6 credits total as topics change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

MUSI 790 - Graduate Recital

Credits: 1 (RD)
Public performance. Repertoire and performance standards as approved by faculty.

Prerequisite(s): At least three credits of graduate PMI in the appropriate instrument or voice.

Corequisite(s): MUSI 700-level PMI (3-credits).

Notes: May be repeated for up to 4 credits total.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

MUSI 796 - Directed Reading/Research

Credits: 1-3 (RD)
Individualized study on a topic approved by faculty.

Prerequisite(s): Baccalaureate degree in music, graduate placement exam.

Notes: May be repeated for up to 6 total credits.

Hours of Lecture or Seminar per week: 1
MUSI 799 - Thesis

Credits: 1-6 (RD)
Supervised research on approved thesis topic.

Prerequisite(s): At least 12 graduate credits including MUSI 511, and approval of thesis topic.

Notes: Students in the music education concentration must also have taken MUSI 562, and have successfully passed comprehensive exit exam.

MUSI 800 - Studies for the Doctor of Philosophy in Education

Credits: 1-6 (RD)
Program of studies designed by the student's discipline director and approved by student's doctoral committee that brings student to participate in research, performance, or creative activity of discipline director and results in a paper reporting original contributions.

Prerequisite(s): Admission to PhD in education program to study music.

Notes: Enrollment may be repeated.

MUSI 810 - Doctoral Seminar in Analysis

Credits: 3 (RD)
Seminar study of a specific genre or repertoire from various analytical perspectives.

Prerequisite(s): Graduate placement examination.

Notes: May be repeated for up to 9 credits as topics change.

MUSI 821 - Doctoral Private Music Instruction
Private instruction in performance, conducting, or composition.

**Prerequisite(s):** Audition portfolio

**Notes:** May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 1

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**MUSI 822 - Doctoral Applied Music in Keyboard**

Credits: 2-3 (RD)  
Doctoral applied music studies in Keyboard.

**Prerequisite(s):** Audition.

**Notes:** May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 1

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**MUSI 823 - Doctoral Applied Music in Voice**

Credits: 2-3 (RD)  
Doctoral applied music studies in Voice.

**Prerequisite(s):** Audition.

**Notes:** May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 1

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**MUSI 824 - Doctoral Applied Music in Woodwind**

Credits: 2-3 (RD)  
Doctoral applied music studies in Woodwind.

**Prerequisite(s):** Audition.

**Notes:** May be repeated for up to 18 credits.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 1
MUSI 825 - Doctoral Applied Music in Brass

Credits: 2-3 (RD)
Doctoral applied music studies in Brass.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1

MUSI 826 - Doctoral Applied Music in String

Credits: 2-3 (RD)
Doctoral applied music studies in String.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1

MUSI 827 - Doctoral Applied Music in Percussion

Credits: 2-3 (RD)
Doctoral applied music studies in Percussion.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 1

MUSI 828 - Doctoral Applied Music in Composition

Credits: 2-3 (RD)
Doctoral applied music studies in Composition.

Prerequisite(s): Portfolio of recent compositions.

Notes: May be repeated for up to 18 credits.


MUSI 829 - Doctoral Applied Music in Conducting

Credits: 2-3 (RD)
Doctoral applied music studies in Conducting.

Prerequisite(s): Audition.

Notes: May be repeated for up to 18 credits.

MUSI 830 - Doctoral Seminar in Music History

Credits: 3 (RD)
Seminar study of a specific genre, composer, or repertoire from a historically analytical perspective.

Prerequisite(s): Graduate placement exam.

Notes: May be repeated for up to 9 credits as topics change.

MUSI 860 - Doctoral Seminar in Music Education

Credits: 3 (RD)
Seminar study of a specific issue in music education.

Prerequisite(s): Graduate placement exam.

Notes: May be repeated for up to 12 credits as topics change.

MUSI 880 - Doctoral Major Ensemble

Credits: 1 (RD)
Selective ensemble experience for doctoral students in music.
Prerequisite(s): Audition.

Notes: Public concerts are given. May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3

MUSI 890 - Doctoral Recital

Credits: 1 (RD)
Public performance. Repertoire and performance standards as approved by faculty.

Prerequisite(s): At least 3 credits in MUSI 821 in the appropriate instrument or voice.

Corequisite(s): MUSI 821 (3-credit level).

Notes: May be repeated for up to 4 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

MUSI 998 - Dissertation Proposal

Credits: 1-3 (RD)
Preparation of a proposal for a dissertation study in music under the supervision of music faculty members.

Prerequisite(s): Admission to doctoral program in music, permission of faculty.

Notes: May be repeated for up to 6 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

MUSI 999 - Dissertation

Credits: 1-12 (RD)
Preparation of a dissertation in music under the supervision of music faculty members.

Prerequisite(s): Candidacy in a doctoral program in music.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
Native American and Indigenous Studies (NAIS)

Offered by the College of Humanities and Social Sciences

NAIS 201 - Introduction to Native American and Indigenous Studies

Credits: 3 (NR)
Introduction to the history, social organization, political experience, and artistic expression of indigenous peoples of the western hemisphere, focusing primarily on American Indians, using methods and materials from a number of disciplines.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NAIS 499 - Independent Study

Credits: 3 (NR)
Intensive study of a particular area, topic, or critical or theoretical problem related to Native American and Indigenous Studies to be conducted in close consultation with an instructor. At least one substantial, researched piece of written work required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Nanotechnology (NANO)

Offered by the College of Science

NANO 500 - Introduction to Nanomaterials and Interactions

Credits: 3 (NR)
Introduction to nanotechnology. Discussion of the Feynman challenge and its relation to modern science. Applications to nanostructures of charges, currents, diamagnetics, paramagnetics, and ferromagnetics.

Prerequisite(s): BS in any physical science, mathematics, or engineering; or permission of certificate director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NANO 510 - Strategies for Nanocharacterization

Credits: 3 (NR)
Introduces various nanocharacterization techniques, with a discussion of which techniques are most useful in various
applications. Includes gates and bridges, chemical thermodynamics, kinetics, and solid-state reactions.

Prerequisite(s): NANO 500 or permission of certificate director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NANO 520 - Survey of Nanostructures

Credits: 3 (NR)
Discuss nanomechanical oscillators and nanoresonators, nanofibers, and conducting polymer nanowires. Nanomechanical beams for reacting ion etching. Electron-beam lithography and photolithography.

Prerequisite(s): NANO 500 and 510 or permission of certificate director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NANO 530 - Nanofabrication

Credits: 3 (NR)
Covers pulsed laser deposition, molecular beam epitaxy, controlled vapor deposition, reactive sputtering, and doping and implant isolation.

Prerequisite(s): NANO 500 and 510, or permission of certificate director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NANO 540 - Nanotechnology in Commerce and Government

Credits: 3 (NR)
Discuss competitive position of United States and other countries in nanoscience and nanotechnology. Covers business strategies, environmental, and public health aspects of nanotechnology applications. Also introduces students to issues involving legal, economic, social, and political controls over nanotechnology and nanoscience research.

Prerequisite(s): NANO 500, and admission into graduate certificate program in nanotechnology and nanoscience.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NANO 610 - Nanoelectronics
NANO 620 - Computational Modeling in Nanoscience

Credits: 3 (NR)
Introduction to simulation methods used in nanoscience. Covers computational approaches to modeling molecular and condensed matter at the nanoscale level, including interatomic and molecular potentials, molecular mechanics, molecular dynamics, monte carlo averaging, ensemble distributions, numerical sampling, thermodynamic functions, dynamic structure, and introduction to cellular automata.

Prerequisite(s): NANO 500, 510, and 520, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Neurosciences (NEUR)

Offered by the University

NEUR 327 - Cellular, Neurophysiological, and Pharmacological Neuroscience

Credits: 3 (NR)
Basic concepts of cellular and molecular level neuroscience, including neuronal functions, cellular anatomy and membrane functions, electrical properties of neurons, and cellular basis of plasticity.

Prerequisite(s): PSYC 375 with a grade of 3.00 or better, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

NEUR 335 - Molecular, Developmental, and Systems Neuroscience

Credits: 3 (NR)
In-depth survey of genetic and embryological development of the brain and introduction to systems neuroscience, including
sections on patterning gene expression, generation and migration of neurons, axonal and dendritic outgrowth, and basic neuroanatomy.

Prerequisite(s): NEUR 210 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 3
When Offered: Fall

NEUR 410 - Current Topics in Neuroscience

Credits: 3 (NR)
Overview of current topics in neuroscience, focusing on research at Mason.

Prerequisite(s): PSYC 375, 376. NSCI 327 recommended.

Notes: NSCI 410 is a writing intensive course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

NEUR 461 - Special Topics in Neuroscience

Credits: 1-3 (RT)
Selected topics reflecting in specialized areas of neuroscience.

Equivalent to NSCI 461 (2009-10 catalog)

Prerequisite(s): PSYC 372, 375, or equivalent or permission of instructor.

Notes: May be repeated three times for credit when topic is different.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

NEUR 600 - Chemistry and the Brain

Credits: 3 (NR)
Fundamentals of general chemistry, atoms, molecules, and reactions, with emphasis on water solutions. Organic compounds and functional groups, biosynthesis and properties, and examples from nervous system. Also includes biopolymers and their roles in cellular and neuronal organization, ionic channels, neurotransmitter receptors, and psychoactive substances.

Equivalent to PSYC 556

Prerequisite(s): Admission to neuroscience PhD program or permission of instructor.
NEUR 601 - Developmental Neuroscience

Credits: 2 (NR)
Introduction to neurobiology with overview of embryological development of the nervous system in evolutionary context. Regional and systems neuroanatomy introduced by study of the mammalian visual system with a comparative perspective.

Equivalent to PSYC 527

Prerequisite(s): PSYC 372, or BIOL 213 and 303, or the equivalent.

NEUR 602 - Cellular Neuroscience

Credits: 3 (NR)
Detailed overview of the functioning and interactions of the cellular elements of the central nervous system. Topics include structure and function relationships, the chemical, physical, and electrical basis of neural signaling, local versus long-distance signaling, generation of action potentials, and essentials of synaptic communication.

Prerequisite(s): Admission to the PhD program in Neuroscience or permission of instructor.

NEUR 603 - Mammalian Neurobiology

Credits: 3 (NR)
Functional anatomy of the brains of mammals, with emphasis on regional and systems neuroanatomy of humans. Anatomy is correlated with material from clinical neurology where possible. Laboratory component includes brain dissections and clinical correlations.

Equivalent to PSYC 531

Prerequisite(s): NEUR 601

NEUR 604 - Ethics in Scientific Research
Credits: 1-3 (NR)
Reflects on purpose of scientific research and reviews foundational principles for evaluating ethical issues. Offers skills for survival in scientific research through training in moral reasoning and teaching of responsible conduct. Discusses ethical issues in research, and teaches how to apply critical thinking skills to design, execution, and analysis of experiments. Issues include using animals and humans in research, ethical standards in computer community, and research fraud. Currently accepted guidelines for behavior in data ownership, manuscript preparation, and conduct of persons in authority may be presented and discussed in terms of relevant ethical issues.

Equivalent to PHIL 691

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0

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**NEUR 611 - Philosophical Foundation of Neuroscience**

Credits: 3 (NR)
This course presents the joint histories of the nature of thought, the philosophy of science, the construct of self, and the nature of mind.

**Prerequisite(s):** Any course in neuroscience or permission of the instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**NEUR 621 - Synaptic Plasticity**

Credits: 3 (NR)
Course on activity-dependent modification of functional connectivity in the central nervous system as it relates to development, cognition, and disease.

**Prerequisite(s):** NEUR 602

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**NEUR 634 - Neural Modeling**

Credits: 3 (NR)
Introduces the objectives, philosophy, and methodology of neuronal modeling. Instructs students in the use of some of the more popular neural modeling software packages. Students learn the syntax of several software packages, how to create neurons from subcellular components, and how to create networks by connecting neuron models.

**Prerequisite(s):** NEUR 602 or permission of instructor.
**NEUR 689 - Topics in Neuroscience**

Credits: 3 (RT)
Selected topics in neuroscience reflecting specialized areas or new subfields not covered in fixed-content neuroscience courses.

**Notes:** Course may be repeated for credit as needed.

**NEUR 701 - Neurophysiology Laboratory**

Credits: 3 (NR)
Hands-on training in current techniques of modern neurophysiology. Acquaints students with the theoretical basis of each technique and trains the student in the laboratory skills necessary to perform each technique. Includes intracellular and extracellular recording techniques.

**Prerequisite(s):** NEUR 602 and admission to neuroscience PhD program or permission of instructor.

**Notes:** Meets once weekly for six hours.

**NEUR 702 - Research Methods**

Credits: 3 (NR)
Trains students in research methodologies, techniques, and data analysis in neuroscience. The course is divided into three modules that introduce separate but equally significant components of any research project. The first module will focus on parameters required for outlining and synthesizing a problem. The second module will cover various techniques of measurement and analysis used by neuroscientists. The last module will cover various approaches used for data analysis and interpretations.

**Prerequisite(s):** Graduate standing.

**NEUR 703 - Laboratory Rotation and Readings**

Credits: 3 (NR)
Intensive introduction to a research laboratory in neuroscience. The student will read background material pertinent to the
problem under study, learn and practice research methods of the laboratory, and formulate a short final project, which may be a proposal or an actual project, demonstrating some mastery of the techniques and approaches employed.

**Prerequisite(s):** Admission to the PhD program in Neuroscience.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

### NEUR 709 - Neuroscience Seminars

**Credits:** 1 (NR)  
Special seminar series for first year neuroscience PhD students. Detailed overview of neuroscience research at Mason. Each week, a different neuroscience laboratory and principal investigator lectures to students. The lecture includes the neuroscience basics necessary to appreciate the laboratory research theme and mission, and a more practical description of the active research program, possibly including a visit to the laboratory.

**Prerequisite(s):** Admission to neuroscience PhD program.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### NEUR 710 - Special Topics in Neuroscience

**Credits:** 1 (NR)  
Examines topics in neurosciences, including neurogenetics, neural imaging, and the competing computational and biological approaches to understanding the mind.

**Prerequisite(s):** Admission to neuroscience PhD program.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### NEUR 734 - Computational Neurobiology

**Credits:** 3 (NR)  
Intense review of neurobiology for graduate students interested in studying how nerve cells integrate and transmit signals, and how behavior emerges from integrated actions of populations or circuits of nerve cells. Covers electrical and biochemical properties of single neurons, and electrical and chemical communication between neurons. Emphasizes mathematical descriptions and computational techniques to study and understand neurons and networks of neurons.

**Prerequisite(s):** NEUR 602 and MATH 214, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
NEUR 735 - Computational Neuroscience Systems

Credits: 3 (NR)
Intensive introduction to systems neuroscience from quantitative perspective. Covers computational techniques used to study function of networks of neurons. Uses spike train statistics, neural encoding, and information theory to investigate behaviors that emerge from integrated actions of networks of neurons.

Prerequisite(s): NEUR 734, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NEUR 741 - Introduction to Neuroimaging

Credits: 3 (NR)
Introduction to physics and techniques of magnetic resonance imaging (MRI) and their applications to clinical and basic neuroscience. Students learn about the protocols used in the acquisition of images in both structural and functional contexts, and experimental paradigms applied to the exploration of cognition, learning, and development. Students gain experience with creating an experimental design for a study and understanding practical logistics involved in imaging, such as MRI safety and subject screening.

Prerequisite(s): NEUR 602 or 603, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NEUR 742 - Cognitive Neuroscience

Credits: 3 (NR)
Introduces cognitive neuroscience topics, including aspects of cognitive science covering an array of perceptual, sensory, cognitive, and affective processes. Incorporates studies of brain lesions, brain imaging, and animal and computational models.

Prerequisite(s): NEUR 602 or 603, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NEUR 751 - Applied Dynamics in Neuroscience

Credits: 3 (NR)
Covers recent developments in the application of applied dynamics to neuroscience. Emphasizes dynamical system approach to the understanding of neural processes. Topics include neural synchrony and control; formation of waves; oscillations; patterns within neural ensembles; network topology and dynamics of neurons; and decoding and encoding of neural signals.

Prerequisite(s): NEUR 603 or NEUR 734, or permission of instructor.
**NEUR 752 - Modern Instrumentation in Neuroscience**

Credits: 3 (NR)
Builds on knowledge of how and what things are measured and controlled in modern bioinstrumentation. Topics include fundamental instrumentation; principles of sensing; basic electronics; computer interfaces and data acquisition; signals in biological systems; biopotential and ionic concentration measurements; and optical techniques.

Prerequisite(s): NEUR 602 or 734, or permission of instructor.

**NEUR 851 - Advanced Computation and Brain Dynamics**

Credits: 3 (NR)
In-depth study of open issues and the state-of-the-art in advanced brain dynamics. Using mathematical and physical models, the course covers the neurodynamical aspects of neural nets, receptive fields, ion-channels, intercortical interactions, phase-locking, synchronicity, and the possible nontrivial role of quantum effects.

Prerequisite(s): NEUR 603 or NEUR 734, or permission of instructor.

**NEUR 996 - Doctoral Reading and Research**

Credits: 1-6 (RD)
Reading and research on specific topic in neuroscience under direction of faculty member.

Prerequisite(s): Admission to NEUR PhD, and permission of instructor.

Notes: May be repeated as needed.

**NEUR 998 - Dissertation Proposal**

Credits: 1-6 (RD)
Covers development of a research proposal under guidance of dissertation director and doctoral committee. Proposal forms the basis for the doctoral dissertation.
Prerequisite(s): Admission to the Neuroscience Ph.D. program.

Notes: Course may be repeated as needed; however, no more than a total of 24 credits in NEUR 998 and 999 may be applied toward satisfying doctoral degree requirements. Out of the 24, no more than 12 credits of NEUR 998 may be applied.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

NEUR 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral research performed under the direction of the dissertation director.

Prerequisite(s): Admission to candidacy in neuroscience doctoral program.

Notes: May be repeated as needed; however, no more than a total of 24 credits in NEUR 998 and 999 may be applied toward satisfying doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/IP

New Century College (NCLC)

Offered by the College of Humanities and Social Sciences

NCLC 101 - Narratives of Identity

Credits: 6 (NR)
Explores the concept of identity through the study of literature and oral communication. Introduces aesthetic, cultural, and historical aspects of these forms of communication as well as their psychological, political, and practical significance, with special emphasis on the role of communication in a free society.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

NCLC 102 - Global Networks and Communities

Credits: 6 (NR)
Prepares students for participation in a global society by investigating global and local issues in a historical context. Considers critical topics of western civilization, globalization, (neo)colonialism, imperialism, and hegemony. Students gain an in-depth perspective of the intricate relationships between people and cultures at various moments in our history.
NCLC 103 - Human Creativity: Science and Art

Credits: 6 (NR)
Investigates the vital role played by human creativity in fine arts and natural sciences. Fosters an understanding of the aesthetic and intellectual components of the arts while exploring the scientific method, the relation of theory and experiment, and the development and elaboration of major ideas in science.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

NCLC 111 - Composition, Communication and Community

Credits: 7 (NR)
Students study key skills for our information economy. They research original ideas and analyze critically the ideas of others. They also learn to communicate their conclusions through writing, speech, and the creative use of electronic media. Topics covered include writing to learn, information literacy, individual and small-group communication, and collaborative problem solving.

Notes: Credit distribution: written communication (3), oral communication (2), quantitative reasoning (1), and information technology (2).

Hours of Lecture or Seminar per week: 7
Hours of Lab or Studio per week: 0

NCLC 121 - Science, Mathematics, and Technology in Society

Credits: 7 (NR)
Building on skills developed in NCLC 110/111, designed for students pursuing a BA or BS in integrative studies within New Century College. Introduces natural sciences and their relation to mathematics. After building a knowledge base, students explore the natural world through contemporary issues. Discusses man and nature from biological, historical, and contemporary viewpoints, while developing an understanding of how science develops and communicates ideas. Students learn to work in groups to solve problems and work through issues, then publicly present ideas through debates, posters and various written formats.

Notes: Credit distribution: math/analytical reasoning (3), and natural science (4).

Hours of Lecture or Seminar per week: 7
Hours of Lab or Studio per week: 0

NCLC 165 - Independent Study
Individualized section form required. Study of a topic not otherwise available to the student. May involve any combination of reading assignments, tutorials, lectures, papers, presentations, or field/laboratory study (determined in consultation with instructor). Students are encouraged to work as a team on a particular topic.

Prerequisite(s): Permission of instructor and dean.

Notes: Maximum 12 credits can be used to fulfill graduation requirements.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 1-12

NCLC 190 - Internship

Credits: 1-6 (RT)
Internship credit may be applied to 12 credits required in experiential learning. Primary purpose is to connect the student's academic course work to experiences and challenges outside the university classroom. The faculty also expects that students will enhance their competencies and skills and explore career options.

Prerequisite(s): Sophomore standing and permission of instructor.

Notes: Students may take no more than 6 credits in any one semester, unless approved by director of experiential learning or associate dean. Structured and supervised professional experience, within an approved agency, for which the student earns academic credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-6
Grading: Undergraduate Special

NCLC 194 - Service-Learning Experience

Credits: 1-15 (RT)
Service-learning courses offer students, faculty, and community partners an opportunity to work together to integrate and apply knowledge to address community needs. Learning goals, action strategies, and assignments developed collaboratively. Students demonstrate progress through critical reflection that illustrates growth in acquiring and comprehending values, skills, and knowledge content. Critical reflection may take the form of papers, presentations, portfolios, journals, and exams.

Hours of Lecture or Seminar per week: 1-15
Hours of Lab or Studio per week: 0

NCLC 195 - Field-Based Work

Credits: 1-6 (RT)
Directed field studies in topic not otherwise available to students.

Notes: Topics vary, but entire course or significant component is located off campus. In addition to fieldwork, course may also include reading assignments, tutorials, lectures, papers, presentations, portfolios, journals, and exams. Students bear costs of
required field trips and should consult Center for Field Studies for more information.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

**NCLC 196 - Teaching Assistant Experience**

Credits: 1-6 (RD)  
Teaching assistantship and peer-mentoring duties carried out through existing university programs, such as Technology Assistants, Writing Tutors, and Residence Advisors. Also includes teaching assistantship arrangements for specific courses detailed in individualized course contract signed by instructor and student. In addition to peer mentoring/advising, course work may include logistical support, reading assignments, papers, presentations, and portfolios.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

**NCLC 197 - Add-On Experiential Learning**

Credits: 1-3 (RT)  
For students who wish to add one or more experiential learning credit to existing experiential learning course or learning community.

**Prerequisite(s):** Must be enrolled in a learning community or experiential learning class to add this additional credit.

**Notes:** May also be used by students who wish to add an experiential learning component to course that provides no experiential learning credit (with permission of instructor). Unless experiential learning add-on requirements are spelled out in course syllabus, requirements for add-on experiential learning credit must be detailed in individualized course contract signed by instructor and student.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

**NCLC 198 - Field-Based Work**

Credits: 1-15 (RT)  
Experiential-based individualized studies, mentored by instructor.

**Notes:** Topics decided by student and instructor, and approved by associate dean. Requirements must be detailed in individualized course contract signed by student, instructor, and associate dean. May include reading assignments, papers, journals, and portfolios.

**Hours of Lecture or Seminar per week:** 1-15  
**Hours of Lab or Studio per week:** 0

**NCLC 200 - Visual Thinking and the Creativity**
Credits: 3-15 (NR)
Investigates modes of visual and textual creativity through art, literature, and variety of visual and textual forms. Through interdisciplinary approach to picturing text, provides opportunity to experiment with creative composition that includes visual elements, and with art forms that include textual elements. Explores blocks to creativity, and provides understanding of how to evaluate and write about visual texts as well as how to produce documents that integrate words and images.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1

**NCLC 201 - The World Since 1945**

Credits: 6 (NR)
Examines the history of the past 50 years to illuminate the contemporary world as well as build connections between the global and local. Using historical works, fiction, autobiographies, films, and daily newspapers, students explore such major events as the Cold War, the struggle against apartheid in South Africa, the Vietnam War, the Chinese Cultural Revolution, and the continuing conflict in the Middle East. As a learning community, requires active student participation in group projects and discussions.

**Hours of Lecture or Seminar per week:** 3-15  
**Hours of Lab or Studio per week:** 0

**NCLC 202 - Public Speaking and Critical Thinking Skills**

Credits: 4 (NR)
Combines process of learning to speak in front of audiences with analysis of arguments and persuasive appeals. Students learn how to create and present effective speeches, adapt messages to specific audiences, and evaluate and critique messages produced for others. One credit of experiential learning enables students to examine public speeches, news stories, political campaigns, and advertising, among others, to make meaningful connections between public speaking theory and practice.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1

**NCLC 203 - Inquiry for Action: Facilitating Change**

Credits: 6 (NR)
Examines the relationships between academic research, individual acts and society's social and political structures. Students design a community-based research project, explore a rich array of qualitative and quantitative approaches, apply information and communication technologies to all aspects of the research process, and learn from individuals and organizations outside the classroom.

**Hours of Lecture or Seminar per week:** 6  
**Hours of Lab or Studio per week:** 0

**NCLC 204 - Leadership Theory and Practice**
Credits: 3 (NR)
Examines historical and contemporary leadership theories, and analyzes various methods and styles of leadership while providing students with opportunity to better understand their leadership strengths and challenges.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

**NCLC 210 - Sustainable World**

Credits: 4 (NR)

Covers basic issues in the natural and social sciences that underlie current environmental problems. Considers ethical matters such as equity as they pertain to global resource consumption, pollution, and climate change. Designated a Green Leaf Course.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

**NCLC 211 - Introduction to Conservation Studies**

Credits: 3-6 (NR)

Provides foundation for the integrative study of environmental conservation. Formal and informal writing assignments and oral presentations designed to strengthen critical thinking and communication skills important to students who pursue conservation-related professions. Instructors encourage students to use course assignments and off-campus work to identify suitable educational and career paths within the conservation world.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 2

**NCLC 215 - Introduction to Science and Society**

Credits: 2 (NR)

Provides students in the interdisciplinary minor in science and society with general background information and common frame of reference for developing an individualized core of course work. Students design a plan for their course work in the minor, envision the specific topic they will address, and begin preliminary preparation for NCLC 415.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**NCLC 220 - Energy and Environment**

Credits: 3-6 (NR)
Investigates current sources of energy, various modes of their utilization, and environmental effects. Offers an overview of the mechanical, physical, and chemical methodologies of energy use and delves into the biological, environmental, and ecological aspects of pollution-generating mechanisms.
Designated a Green Leaf Course.

**Hours of Lecture or Seminar per week:** 3-6
**Hours of Lab or Studio per week:** 0

**NCLC 230 - Math and Culture**

Credits: 6 (NR)
Focuses on mathematical problems and their emergence in different cultures and historical moments. Emphasizes interdisciplinary nature of the motivations for the development of mathematics and on the process of mathematical discovery. High degree of faculty/student interaction, which enables students to demonstrate, through the use of presentations and projects, their understanding and mastery of fundamental mathematical ideas and techniques and the role of mathematics in the development of human culture.

**Hours of Lecture or Seminar per week:** 3-15
**Hours of Lab or Studio per week:** 0

**NCLC 231 - Introduction to Community Studies**

Credits: 4 (NR)
Examines relationship between sustainable communities and democratic citizenship in a diverse society. The objectives are to improve one's understanding of and thinking critically about communities and democratic principles, theories and practice. Students identify and work through problems that communities address by working in a community service-learning setting.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 1

**NCLC 244 - Beats, Rhyme, and Culture**

Credits: 4 (NR)
Examines the history of hip-hop and the effect it has had on our society. The primary focus is to consider hip-hop as a medium of communication that impacts, represents, and misrepresents the life experiences of youth in the United States. Students are exposed to historical, socioeconomic, and musical/aesthetic contexts of this genre through in-class activities and by attending related cultural events.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 1

**NCLC 245 - Visual Culture and Society**
Credits: 4 (NR)
Explores the role of visual culture in contemporary society including an examination of photography, the visual and performing arts, film and video, and electronic media. Readings focus on the historical foundations of visuality as well as theories of visual culture and aesthetics. Students investigate the ways that forms of visual culture function in society and how these are linked to race, class, and gender as well as politics and economics. Students will gain hands-on experience working with contemporary visual media tools such as computer graphics and digital video editing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 249 - Digital Literacy

Credits: 4 (NR)
Investigates information literacy, the mobile web, and interactive and immersive media, including gaming, social networking, blogging and micro-blogging, intellectual, political and civic collaborations, digital aesthetics and emerging digital cultures and art forms. Explores major theories of digital literacy and culture and introduce diverse social, artistic, theoretical and cultural practices that characterize today's digital domains and virtual environments.

Notes: One experiential credit is required in this class.

Hours of Lecture or Seminar per week: 3-15
Hours of Lab or Studio per week: 1

NCLC 265 - Independent Study

Credits: 1-12 (RT)
Individualized section form required. Study of a topic not otherwise available to the student. May involve any combination of reading assignments, tutorials, lectures, papers, presentations, or field/laboratory study (determined in consultation with instructor). Students are encouraged to work as a team on a particular topic.

Prerequisite(s): Permission of instructor and dean.

Notes: Maximum 12 credits can be used to fulfill graduation requirements.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 1-12

NCLC 275 - Special Topics

Credits: 1-18 (RT)
Studies topics of special interest to undergraduates.

Notes: May be repeated for a maximum of 18 credits when topic is different.

Hours of Lecture or Seminar per week: 3-15
Hours of Lab or Studio per week: 0
NCLC 290 - Internship

Credits: 1-6 (RT)
Internship credit may be applied to 12 credits required in experiential learning.

Prerequisite(s): Sophomore standing and permission of instructor.

Notes: Students may take no more than 6 credits in any one semester, unless approved by director of experiential learning or associate dean. Structured and supervised professional experience, within an approved agency, for which the student earns academic credit. The primary purpose of an internship is to connect the student's academic course work to experiences and challenges outside the university classroom. The faculty also expects that students will enhance their competencies and skills and explore career options.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1-6
Grading: Undergraduate Special

NCLC 294 - Service-Learning Experience

Credits: 1-15 (RT)
Service-learning courses offer students, faculty, and community partners an opportunity to work together to integrate and apply knowledge to address community needs. Learning goals, action strategies, and assignments developed collaboratively. Students demonstrate progress through critical reflection that illustrates growth in acquiring and comprehending values, skills, and knowledge content. Critical reflection may take the form of papers, presentations, portfolios, journals, and exams.

Hours of Lecture or Seminar per week: 1-15
Hours of Lab or Studio per week: 0

NCLC 295 - Field-Based Work

Credits: 1-18 (RT)
Directed field studies in topic not otherwise available to students.

Notes: Topics vary, but entire course or significant component is located off campus. In addition to fieldwork, course may also include reading assignments, tutorials, lectures, papers, presentations, portfolios, journals, and exams. Students bear costs of required field trips and should consult Center for Field Studies for more information.

Hours of Lecture or Seminar per week: 1-15
Hours of Lab or Studio per week: 0

NCLC 296 - Teaching Assistant Experience

Credits: 1-6 (RD)
Teaching assistantship and peer-mentoring duties carried out through existing university programs, such as technology assistants,
writing tutors, and residence advisors. Also includes teaching assistantship arrangements for specific courses detailed in individualized course contract signed by instructor and student. In addition to peer mentoring/advising, course work may include logistical support, reading assignments, papers, presentations, and portfolios.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

### NCLC 297 - Add-On Experiential Learning

Credits: 1-3 (RT)  
For students who wish to add one or more experiential learning credit to existing experiential learning course or learning community.

**Prerequisite(s):** Must be enrolled in a learning community or experiential learning class to add this additional credit.

**Notes:** May also be used by students who wish to add an experiential learning component to course that provides no experiential learning credit (with permission of instructor). Unless experiential learning add-on requirements are spelled out in course syllabus, requirements for add-on experiential learning credit must be detailed in individualized course contract signed by instructor and student.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

### NCLC 298 - Field-Based Work

Credits: 1-15 (RT)  
Experiential-based individualized studies, mentored by instructor.

**Notes:** Topics decided by student and instructor, and approved by associate dean. Requirements must be detailed in individualized course contract signed by student, instructor, and associate dean. May include reading assignments, papers, journals, and portfolios.

**Hours of Lecture or Seminar per week:** 1-15  
**Hours of Lab or Studio per week:** 0

### NCLC 301 - Science in the News

Credits: 3 (NR)  
Examination and discussion of the current trends in science as reported in the popular media. Students learn how to evaluate the science that is reported so they may become informed consumers; discuss how scientific advancement might shape society by looking at how science and society have changed together over time; and use examples from the past to discuss future trends.

Fulfills writing intensive requirement in the major.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
NCLC 302 - Argument and Advocacy

Credits: 6 (NR)
Develops theoretical background and skills necessary for effective civic engagement and deliberative discourse. Teaches fundamentals of argument construction, function, and analysis. Covers role of argument and advocacy in a democratic society.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

NCLC 304 - Social Movements and Community Activism

Credits: 4 (NR)
Examines how citizens, individually and collectively, accomplish social change in society through case study analysis. Considers advantages and limits of social change strategies from communication and social movement theory perspectives. Surveys topics including how leaders maintain momentum in face of opposition; how movements and organizations use slogans, symbols and music to inspire followers; and how participants construct persuasive media campaigns and political arguments to facilitate policy change.

Fulfills writing intensive requirement in the major.

Notes: One credit of experiential learning enables students to explore their role as social advocates and effective citizens in context of community.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 305 - Conflict Resolution and Transformation

Credits: 6 (NR)
Examines the nature and dynamics of conflict and ways to resolve and transform conflict. Experiential learning is used as the vehicle through which students explore their assumptions about communication and develop their skills for resolving interpersonal conflicts.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

NCLC 306 - Our Common Futures

Credits: 3-6 (NR)
Students and faculty work together to model patterns of life that fit within the planet's ecological means. Involves the study of
“environomics,” introductions to urban systems and planning, and studio work to actually create models of alternative growth.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0

NCLC 307 - Narratives of Nature

Credits: 6 (NR)
Course begins with the individual’s connection to the infinite, the cosmos, and ends in a microscopic examination of the behavior of the human animal. Looks at the fundamental questions relating to scientific thinking and writing.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

NCLC 308 - American Landscapes in Fiction, Film, and History

Credits: 6 (NR)
Waterways and roadways have always had practical, spiritual significance for Americans. Course looks at American literary works and films in historical context to better understand the roles roads, rivers play in shaping physical, cultural landscape of United States. Students explore course themes outside classroom on weekend field trips, and conduct self-directed road trip as a main learning events.

Fulfills general education requirement in synthesis.

Fulfills writing intensive requirement in the major.

Notes: Satisfies requirements for ENGH 302.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 2

NCLC 310 - Violence and Gender

Credits: 3-6 (NR)
Using nonfiction, research documentaries, oral histories, case studies, literature, feature films, music, dance, and visual arts, examines the dynamics of violence through different cultural lenses. Students work in university and community settings to integrate their academic experiences with practice.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0
NCLC 311 - The Mysteries of Migration: Consequences for Conservation

Credits: 6 (NR)
Investigates the biology of migration and its implications for science policy. Students consider the phenomenon of migration in the context of natural history, conservation, and cultural issues. The course includes several weekend trips for field study.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3-15
Hours of Lab or Studio per week: 0

NCLC 312 - Images and Experiences of Childhood: Social Construct, Literature, and Film

Credits: 3-6 (NR)
Immerses students in the images of childhood through the media of literature, video, and poetry, with a strong emphasis on historical perspectives of childhood. The class is interactive, requires some work in groups, and requires classroom participation.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0

NCLC 313 - Strangers in a Strange Land: Immigration in 20th Century America

Credits: 3-6 (NR)
Examines immigration experience as historical reality, culture. Through explorations of historical and contemporary discourse of immigration in United States, illuminates connections between current-day events, and ideas and policies that inform them.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3-15
Hours of Lab or Studio per week: 0

NCLC 314 - Conflict, Trauma and Healing

Credits: 6 (NR)
Develops in students an appreciation of human resilience and helps them acquire better coping mechanisms. Imparts knowledge of the nature and dynamics of trauma and healing. Investigates the difficulties people face in responding to settings of conflict such as war, school shootings, abuse, domestic violence, including natural disaster. Examines case studies from a variety of personal, national, and international settings.

Fulfills writing intensive requirement in the major.
NCLC 315 - Spirituality and Conflict Transformation

Credits: 6 (NR)
Examines dimensions of spirituality, including peacemaking efforts in large-scale conflicts, conflicts within faith communities, and interpersonal disputes. Experiential learning explores spiritually informed resolution.

Fulfills writing intensive requirement in the major.

NCLC 316 - Introduction to Childhood Studies

Credits: 4 (NR)
Focuses on the study of childhood from birth to adolescence from the perspective of several disciplines. Covers childhood theory, research, and policy and their applications to decisions regarding children and youth.

Fulfills writing intensive requirement in the major.

NCLC 317 - Issues in Family Relationships

Credits: 4 (NR)
Dynamics of family systems and issues that shape relationships among family members. How families evolve as members grow, leave, and create related family systems; family roles and forms; and communication patterns, decision-making, conflict, stress, and power. Content draws from family communication, family relations, psychology, and counseling. Lecture, discussion, observation, analysis, research, and role-playing.

Fulfills writing intensive requirement in the major.

Prerequisite(s): 55 credits.

Notes: One credit counts for experiential learning; students complete 45 credits of course-related work outside classroom.

NCLC 318 - Exploring Virginia's Watersheds
Comprehensive overview of history, geography, economics, and management of water resources in Virginia; and how rapidly growing population has measurably degraded resource. Includes one weekend field trip. Designated a Green Leaf Course.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** HIST 120, 121, 122, or equivalent; and EVPP 110 or GGS 102 or GEOL 109 or NCLC 120.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 0

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**NCLC 320 - Construction of Differences: Race, Class, and Gender**

Credits: 6 (NR)  
Investigates race, sex, sexual orientation, and social class in contemporary American society. Examines commonalities in the construction of these categories and experiences of those who occupy them.

Fulfills writing intensive requirement in the major.

**Hours of Lecture or Seminar per week:** 3-15  
**Hours of Lab or Studio per week:** 0

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**NCLC 322 - Teacher: A Historical Perspective**

Credits: 3 (NR)  
Examines the rich heritage of the teaching profession in Western society. Traces the history of educational philosophy and teaching, beginning with the ancient Greeks and culminating in the 21st century United States. Using the exploration of the various philosophies of education as a foundation, examines contemporary images of teachers in literature and film.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**NCLC 330 - Enterprise Development**

Credits: 6 (NR)  
Prepares students for enterprise development in diverse environments by examining the spectrum of sociocultural, organizational, behavioral, strategic, and management factors that impact enterprise creation. Instructional method is interactive, using case studies, scenarios, role playing, guest speakers, and student-driven semester projects to link theory to practice.

Fulfills writing intensive requirement in the major.

**Hours of Lecture or Seminar per week:** 3-15  
**Hours of Lab or Studio per week:** 0
**NCLC 331 - The Nonprofit Sector**

Credits: 4 (NR)
Readings, classroom discussions and activities, and practical experience reveal historical, legal, and socioeconomic forces that define and influence the American nonprofit sector. Explores structures, issues that affect nonprofit management, governing, and financial systems.

Fulfills writing intensive requirement in the major.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1

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**NCLC 333 - The Nature of Mathematics**

Credits: 3 (NR)
Sections include theoretical framework, historical context, connections with some other disciplines, and current issues. The sections are illustrated with selected mathematics topics (more advanced algebra and geometry plus introductions to set theory, probability, calculus, and number theory) Student presentations (in pairs) on what they have read and learned in mathematics, and result of optional experiential learning component of the course.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** Performance on Math Placement Exam equivalent to requirements for entrance to MATH 110 or MATH 111, successful completion of algebra program in mathematics learning center, or any mathematics course that fulfills university’s general education requirement in quantitative reasoning; OR permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**NCLC 334 - Environmental Justice**

Credits: 4 (NR)
Examines historical and contemporary sociopolitical and socioeconomic conditions that have given rise to the environmental justice movement. Analyzes how individuals contribute to environmental justice or injustice through everyday decisions. Considers how environmental justice movement responds to these issues.

Fulfills writing intensive requirement in the major.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**NCLC 335 - Ethics, Communication, and Freedom**
Credits: 3-6 (NR)
Students examine ethical principles, discuss some underlying bases for these principles, and work to understand how such principles are experienced and can be applied in a free society. Focus is on examining potential conflicts between ethics and the freedoms believed essential to a healthy democratic society. Cases drawn from sports, medicine, media, politics, and business.

Fulfills writing intensive requirement in the major.

Prerequisite(s): Sophomore standing and 3 credits each of communication and philosophy; or permission of instructor.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0

NCLC 336 - Poverty, Wealth and Inequality in the US

Credits: 3 (NR)
Explores the social, cultural, political, and spiritual implications of poverty, wealth, and inequality in the United States. Examines the ways in which class identity informs one's views of the world and its politics; how socioeconomic status affects one's access to education and other social goods; and how dominant discourses and stereotypes related to poverty influence mass perception regarding a range of social issues, from educational policy to welfare.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NCLC 337 - Social Justice Consciousness and Personal Transformation

Credits: 3 (NR)
Explores the many spaces at which the quest to strengthen social justice consciousness interacts with processes and commitments for personal transformation. Analyzes through the lens of the activist and in the spirit of bringing mindfulness to activism, how we come to see and experience the world. Examines how socialization informs consciousness.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NCLC 338 - Animal Rights and Animal Exploitation

Credits: 3 (NR)
Explores a combination of critical theories, experiential learning, and dialogical practices to examine the ways in which non-human animals are exploited for human profit. Examines the ramifications of this exploitation ecologically, as a question of sustainability, and spiritually, as a question of the impact of animal abuse on the human spirit. Discusses the use of animals in entertainment, factory farming, animal testing, and sport or trophy hunting; and how individuals and organizations are fighting these practices.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
NCLC 340 - Progress: Can America Figure Out What It Means?

Credits: 3-6 (NR)
Explores our land, the built and the left natural, as valued and sacred. Challenges students as developers and environmentalists, as citizens and business persons, to strive for a win-win scenario.

Fulfills writing intensive requirement in the major.

**Hours of Lecture or Seminar per week:** 3-6
**Hours of Lab or Studio per week:** 0

NCLC 341 - Progress: Washington, the New Edge City?

Credits: 6 (NR)
NCLC 340 investigates how the city, both the good parts and the bad parts, came to be. This course investigates what we might do about the situation. Requires active engagement of the students in research and discussion. Collective field work and class field trips both semesters.

Fulfills writing intensive requirement in the major.

**Notes:** Students may take either Part I or Part II of this course but are encouraged to take both.

**Hours of Lecture or Seminar per week:** 3-15
**Hours of Lab or Studio per week:** 0

NCLC 343 - Interactive Digital Texts

Credits: 3 (NR)
Writing-intensive course devoted to critical reading of new media texts and creation of technology-enriched texts in a variety of rhetorical genres targeted to specific audiences. Includes analysis of text embedded within technology-enhanced writing and that which surrounds this emerging medium. Critical reading and interpretive skills, historical and theoretical contexts for development of contemporary textual media. Allows students to explore critically such genres and gain command of a new rhetorical field for academic, educational, informational, technical, and business communication.

Fulfills writing intensive requirement in the major.

Equivalent to ENGH 376

**Prerequisite(s):** ENGL 101/ENGH 101 or equivalent.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

NCLC 345 - Introduction to Multimedia
Credits: 5 (NR)
Technological, aesthetic, and educational issues of using interactive multimedia. Topics include theoretical underpinnings of some technological issues involved in multimedia computing as well as techniques for authoring interactive multimedia projects using a variety of digital media tools.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 5
Hours of Lab or Studio per week: 0

NCLC 346 - Art as Social Action

Credits: 4 (NR)
This learning community explores historical records to understand different ways art has been produced, distributed, and consumed. Examines ways artists have affected change in their worlds. Through interdisciplinary studies, teaches major social movements and artists and theories used in socially engaged art. Students engage in experiential learning outside classroom as course requirement.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 347 - Gender Representation in Popular Culture

Credits: 3-6 (NR)
Explores the way in which masculinity and femininity have been represented across the decades in television, movies, music videos, pop art, and print media. Provides a review of the scholarship on the historical and contemporary roles of women and men in society, and examines the contradictions and expectations associated with gender roles. Incorporates active group learning through creative, insight-oriented exercises, critical thinking and discussions, and group presentations and media research activities.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0

NCLC 348 - Digital Futures

Credits: 3 or 6 (NR)
Investigates important contemporary issues such as surveillance-privacy, censorship, piracy, gender and ethnicity, digital labor and play, mobile media and globalization, and the commercialization and political potential of the digital public spheres. Introduces students to the latest technological, philosophical and creative thinking on the future of human society in a digital age.

Fulfills writing intensive requirement in the major.

Prerequisite(s): NCLC 249.
NCLC 349 - Writing for Multimedia

Credits: 4 (NR)
Looks at how literary traditions of 20th century meet the cybercultures of 21st century. Workshop course exploring writing tasks facing multimedia professional, whether as a concept and storywriter, a producer, or a hands-on creator of multimedia presentations and narratives. Students practice creative and project-focused writing. Scripting interactivity is a key component of both kinds of multimedia writing; class time is spent working on the skills and concepts needed to creatively communicate interactively.

Fulfills writing intensive requirement in the major.

NCLC 355 - Consciousness, Meaning and Life Purpose

Credits: 3 (NR)
Examines scientific evidence about states of consciousness, providing opportunities for experiences and reflections about the personal impact of states of consciousness on how we find meaningful direction for using our talents. Includes the theory and practice of mindfulness and mediation; finding meaning in dreams; the stress-reduction and creativity-enhancement effects of visualization; and traditions of vision-questing about personal meaning and life purpose.

Fulfills writing intensive requirement in the major.

NCLC 360 - The Built Environment

Credits: 6 (NR)
Examines, records, and interprets objects, structures, and landscapes that compose our built environment. Draws on the fields of historical archaeology, architectural history, and urban geography, and employs photography, cartography, and evocative writing to represent the material world we inhabit. Builds on study of one neighborhood in Arlington, Virginia, and expands to entire metropolitan area.

Fulfills writing intensive requirement in the major.
NCLC 361 - Neighborhood, Community, and Identity

Credits: 3-6 (NR)
Examines processes of neighborhood formation and transformation in the context of urbanism, suburbanism, immigration, and transmigration. Students explore the history and meaning of neighborhoods in the Northern Virginia and the Washington, D.C., metropolitan area.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 3-15
Hours of Lab or Studio per week: 0

NCLC 365 - Independent Study

Credits: 1-12 (RT)
Individualized section form required. Study of a topic not otherwise available to the student. May involve any combination of reading assignments, tutorials, lectures, papers, presentations, or field/laboratory study (determined in consultation with instructor) Students are encouraged to work as a team on a particular topic.

Fulfills writing intensive requirement in the major.

Prerequisite(s): Permission of instructor and dean.

Notes: Maximum 12 credits can be used to fulfill graduation requirements.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 1-12

NCLC 375 - Special Topics

Credits: 1-18 (RT)
Studies topics of special interest to undergraduates.

Fulfills writing intensive requirement in the major.

Notes: May be repeated for a maximum of 18 credits when topic is different.

Hours of Lecture or Seminar per week: 3-15
Hours of Lab or Studio per week: 0

NCLC 378 - Medicine, Justice, and Public Policy

Credits: 3 (NR)
Explores formation of public policy relating to several key issues in medicine. Students examine basic theories of justice and public policy formation and apply these to contemporary issues in the field of medicine. The goal is to examine how current policy on these issues was established and to give examples of major stakeholders in the debate. This course involves some
traditional lecture and discussion classes and also features participative learning through group work and web-based discussions.

Fulfills writing intensive requirement in the major.

**NCLC 379 - Cancer and Its Social Impact**

Credits: 4 (NR)
Introduces epidemiology and biological basis for treatment and prevention of cancer. Students consider the social impact of cancer by looking at how patients and families cope with the disease. A portion of the learning community focuses on working with and learning from people living with cancer. Designed for biology and premedicine students as well as nonscience majors interested in connecting the physiology of health and disease to the human spirit.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** 60 credits, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**NCLC 381 - When Cultural Worlds Collide**

Credits: 6 (NR)
Explores what happens when "civilization" encounters "the jungle" by reading, writing, discussing, and viewing written and filmed works dealing with contacts between cultures with colliding world views. Literature (from Conrad's *The Heart of Darkness* to Shakespeare's *The Tempest* to Burrough's *Tarzan*), news articles, radio broadcasts, web home pages, art exhibits, and many film and video presentations provide the basis for in-class and out-of-class activities.

Fulfills writing intensive requirement in the major.

**Hours of Lecture or Seminar per week:** 3-15
**Hours of Lab or Studio per week:** 0

**NCLC 390 - Internship**

Credits: 1-6 (RT)
Internship credit may be applied to 12 credits required in experiential learning.

Fulfills writing intensive requirement in the major.

**Prerequisite(s):** Sophomore standing and permission of instructor.

**Notes:** Students may take no more than 6 credits in any one semester, unless approved by director of experiential learning or associate dean. Structured and supervised professional experience, within an approved agency, for which the student earns academic credit. The primary purpose of an internship is to connect the student's academic course work to experiences and
challenges outside the university classroom. The faculty also expects that students will enhance their competencies and skills and explore career options.

**Hours of Lecture or Seminar per week:** 1-12  
**Hours of Lab or Studio per week:** 1-6  
**Grading:** Undergraduate Special

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**NCLC 391 - Introduction to Integrative Studies**

Credits: 3 (NR)  
Describes key components of the Integrative Studies Program in New Century College. Students prepare for active participation as a community of learners to develop skills in reflective learning and self-assessment, and identify areas of intellectual and professional interests, values and skills so that students may take greater advantage of opportunities in NCC. As a learning community, this course fosters group collaboration, intensive writing, and reflective learning.

Fulfills writing intensive requirement in the major.

**Notes:** Students may not enroll in this course after completing 12 or more learning community credits or simultaneously with or after completing NCLC 491.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**NCLC 394 - Service-Learning Experience**

Credits: 1-15 (RT)  
Service-learning courses offer students, faculty, and community partners an opportunity to work together to integrate and apply knowledge to address community needs. Learning goals, action strategies, and assignments developed collaboratively. Students demonstrate progress through critical reflection that illustrates growth in acquiring and comprehending values, skills, and knowledge content. Critical reflection may take the form of papers, presentations, portfolios, journals, and exams.

Fulfills writing intensive requirement in the major.

**Hours of Lecture or Seminar per week:** 1-15  
**Hours of Lab or Studio per week:** 0

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**NCLC 395 - Field-Based Work**

Credits: 1-18 (RT)  
Directed field studies in topic not otherwise available to students.

Fulfills writing intensive requirement in the major.

**Notes:** Topics vary, but entire course or significant component is located off campus. In addition to field work, course may also include reading assignments, tutorials, lectures, papers, presentations, portfolios, journals, and exams. Students bear costs of required field trips and should consult Center for Field Studies for more information.
Hours of Lecture or Seminar per week: 1-15
Hours of Lab or Studio per week: 0

NCLC 396 - Teaching Assistant Experience

Credits: 1-6 (RD)
Teaching assistantship and peer-mentoring duties carried out through existing university programs, such as Technology Assistants, Writing Tutors, and Residence Advisors. Also includes teaching assistantship arrangements for specific courses detailed in individualized course contract signed by instructor and student. In addition to peer mentoring/advising, course work may include logistical support, reading assignments, papers, presentations, and portfolios.

Fulfills writing intensive requirement in the major.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

NCLC 397 - Add-On Experiential Learning

Credits: 1-3 (RT)
For students who wish to add one or more experiential learning credit to existing experiential learning course or learning community.

Fulfills writing intensive requirement in the major.

Prerequisite(s): Must be enrolled in a learning community or experiential learning class to add this additional credit.

Notes: May also be used by students who wish to add an experiential learning component to course that provides no experiential learning credit (with permission of instructor). Unless experiential learning add-on requirements are spelled out in course syllabus, requirements for add-on experiential learning credit must be detailed in individualized course contract signed by instructor and student.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

NCLC 398 - Field-Based Work

Credits: 1-15 (RT)
Experiential-based individualized studies, mentored by instructor.

Fulfills writing intensive requirement in the major.

Notes: Topics decided by student and instructor and approved by associate dean. Requirements must be detailed in individualized course contract signed by student, instructor, and associate dean. May include reading assignments, papers, journals, and portfolios.

Hours of Lecture or Seminar per week: 1-15
Hours of Lab or Studio per week: 0
NCLC 399 - Study Abroad

Credits: 1-6 (RT)
Intended for participation in formally organized course offered by Center for Global Education.

Fulfills writing intensive requirement in the major.

Notes: May be repeated for a maximum of 8 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

NCLC 400 - Temptress: Constructs of Sex and Power

Credits: 3 (NR)
Examines the portrayal of powerful and/or sexual women throughout history, identifying famous historical "temptresses" and investigating the facts known about them. Explores representations and perceptions of contemporary female sexuality, considering possible future concepts and images of female power and sexuality.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NCLC 401 - Conservation Biology

Credits: 6 (NR)
Provides students with a working knowledge of conservation biology. Integrates the study of social, economic, and political factors with biodiversity, population modeling, habitat degradation, and management issues. Students confront the leading edge of this exciting field by developing real species conservation plans. The experiential learning component of the course will include trips to the Smithsonian Institution's Conservation and Research Center in Front Royal, Virginia, to study with nationally known experts.

Prerequisite(s): Junior standing. or permission of instructor.

Hours of Lecture or Seminar per week: 3-15
Hours of Lab or Studio per week: 0

NCLC 402 - Plants and People - Sustenance, Ceremony, and Sustainability

Credits: 6 (NR)
Examines the direct relationships between people and plants by integrating perspectives from both ethnobotany and economic botany. Provides students with an appreciation of the fundamental role of plants and plant-derived products in all aspects of human life in both industrialized and non-industrialized societies. Explores how plants and their uses have shaped both past and present cultures around the world.
NCLC 404 - Ethics and Leadership

Credits: 4 (NR)
Studies the relationship between ethics and leadership from a wide range of disciplines, fields, and professions. Explore such questions as, Is ethical leadership desirable and necessary? What is the responsibility of leaders to establish ethical climates in their organizations and communities? What are the tensions between ethics and leadership?

NCLC 405 - Women and Leadership

Credits: 4 (NR)
Examines leadership within the context of the theoretical principles of women's studies through discussion of course texts, interactive exercises, field trips, documentary films, guest speakers, and reflection. Investigates the role that gender plays in the various forms of leadership and leadership styles. Explores the historical record of women in leadership roles, identifying the barriers as well as the opportunities.

NCLC 410 - Contemporary Health Issues

Credits: 3-18 (NR)
Looks at a variety of health and health care issues. Examines several of the major health concerns of women and, to a lesser degree, men. Also explores the biology and medical implications of these diseases and how our society deals with potential life-altering information. Examines who is making the decisions on the allocation of research funds and prevention of diseases.

NCLC 415 - Perspectives on Science and Society

Credits: 1 (NR)
Capstone course for the interdisciplinary minor in science and society. Helps students integrate material from their individualized core of courses and make explicit connections among the various disciplines. Provides opportunity for students to share their experiences, expanding their breadth of knowledge in this important and timely area of study.

Prerequisite(s): NCLC 215 and completion of 17 credits toward the minor in science and society.
NCLC 416 - Refugee and Internal Displacement

Credits: 3 (NR)
Provides students with a deeper understanding of refugee and internal displacement. Explores causes of displacement and its impact on people and societies. Studies the role played by governments, non-governmental organizations (NGOs) and the international community in addressing problems faced by refugees in internally displaced persons in terms of relief assistance and humanitarian services.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NCLC 420 - Work Effectiveness Skills

Credits: 3 (NR)
Develops a variety of work-readiness skills needed to become successful in both local and global marketplaces. Topics and skills covered include communication, problem solving in the business setting, workplace ethics, listening skills, how to influence others, building team project rapport, and meeting effectiveness skills.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NCLC 422 - An Experiential Approach to American Foreign Policy

Credits: 3-6 (NR)
Takes an experiential approach to the study of American foreign policy. Through case studies, discussions, group projects, and directed research, students learn how foreign policy is made and executed and how they as citizens, activists, or officials can influence national decisions.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0

NCLC 423 - Management in the Global Marketplace

Credits: 6 (NR)
Experiential approach to the study of global management and organizational behavior. Through exercises, case studies, discussions, group projects, and individual research and essays, students learn the principles of effective management as they apply to modern global organizations, whether public, private, or nonprofit.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0
NCLC 431 - Principles of Fund Raising

Credits: 4 (NR)
Examines history of philanthropy and public policy, and the economic and legal frameworks that shape it. Combining theory and practice, students study human behavior, communications, and management systems that are hallmarks of successful fund raising, and begin to develop skills to generate donations, foundation grants, and other unearned revenue for a nonprofit organization.

Prerequisite(s): NCLC 331.

Notes: Includes 1 experiential learning credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 435 - Leadership in a Changing Environment

Credits: 4 (NR)
Explores the basic framework for change management. It examines leadership styles focusing on historical, philosophical, and industrial examples, as well as personal change stories. Students learn about the diverse nature of leadership, explore historical perspectives on leadership, and interview business and community leaders to understand strategies for change.

Prerequisite(s): 60 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 436 - Social Justice Education

Credits: 4 (NR)
Examines educational policy, practice, and materials using a variety of lenses informed by social justice theory and praxis. Investigates ways in which racism, sexism, economic injustice, heterosexism, ageism, and other forms of discrimination influence schools and educational access and opportunity for youth. Considers and practices what individuals and communities can do to ensure that all students have equitable educational opportunities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 440 - Death, Dying, and Decision Making

Credits: 3 (NR)
Interdisciplinary examination of clinical care of dying persons along with psychosocial issues related to processes of death and dying. Special emphasis on application of ethical principles in resolving complex problems for individuals with life-threatening illnesses and their families as care givers or decision makers. Students consider the changing norms and mores surrounding end-
of-life decisions and explore the care available to terminally ill patients.

**Prerequisite(s):** 60 credits, or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NCLC 445 - Multimedia Design**

Credits: 5 (NR)  
Technological, aesthetic, and educational issues of using interactive multimedia. Topics include theory and practice, integration of digital media, interface and navigation studies, and technical constraints on design.

**Prerequisite(s):** NCLC 345, or permission of instructor.

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 1

**NCLC 446 - Art, Beauty, and Culture**

Credits: 3-6 (NR)  
Designed to help students understand the culture- and time-bound nature of beauty as it relates to art. Exploration of how the codes of acceptability in art forms have changed over time, with discussion about the subversive nature of art and the role that beauty plays in art that is created to engage the viewer in some type of action. Exercises include research projects, site visits, and gallery attendance.

**Hours of Lecture or Seminar per week:** 3-6  
**Hours of Lab or Studio per week:** 0

**NCLC 449 - Multimedia Research and Project Development**

Credits: 4 (NR)  
Provides a solid background in multimedia research and concept development from a scientific yet practical point of view. Students gain a full understanding of the computer-based principles behind multimedia and appreciate the symbiotic relationship between the two. Students also learn about the life cycle of development for a multimedia application including what constitutes a good idea, usability testing, and copyright issues.

**Prerequisite(s):** NCLC 345, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1

**NCLC 455 - Consciousness and Transformation in Action**
Covers how principles and practices of consciousness and transformation relate to the major and career pathway it represents. Includes the theory and practices for deepening the student's own experience with the mindfulness and contemplative approaches to inquire. Capstone course for the minor in consciousness and transformation.

**Prerequisite(s):** NCLC 355 and 356

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

### NCLC 465 - Independent Study

Credits: 1-12 (RT)  
Individualized section form required. Study of a topic not otherwise available to the student. May involve any combination of reading assignments, tutorials, lectures, papers, presentations, or field/laboratory study (determined in consultation with instructor) Students are encouraged to work as a team on a particular topic.

**Prerequisite(s):** Permission of instructor and dean.

**Notes:** Maximum 12 credits can be used to fulfill graduation requirements.

**Hours of Lecture or Seminar per week:** 1-12  
**Hours of Lab or Studio per week:** 1-12

### NCLC 475 - Special Topics

Credits: 1-18 (RT)  
Studies topics of special interest to undergraduates.

**Notes:** May be repeated for a maximum of 18 credits when topic is different.

**Hours of Lecture or Seminar per week:** 3-15  
**Hours of Lab or Studio per week:** 0

### NCLC 490 - Internship

Credits: 1-6 (RT)  
Internship credit may be applied to 12 credits required in experiential learning.

**Prerequisite(s):** Sophomore standing and permission of instructor.

**Notes:** Students may take no more than 6 credits in any one semester, unless approved by director of experiential learning or associate dean. Structured and supervised professional experience, within an approved agency, for which the student earns academic credit. The primary purpose of an internship is to connect the student's academic course work to experiences and challenges outside the university classroom. The faculty also expects that students will enhance their competencies and skills and explore career options.
**NCLC 491 - The Senior Capstone Experience**

Credits: 3 (NR)
Should be taken semester before graduation; 85 credits required. Graduation requirement for integrative studies students. Students complete final NCC portfolio and senior exposition. Provides information on issues of professional development (interviewing skills, resume development, career strategies, and alumni opportunities).

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NCLC 492 - Graduation Portfolio**

Credits: 0 (RD)  
**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit

**NCLC 493 - Graduation Portfolio**

Credits: 0 (RD)  
**Notes:** NCLC 493 is for students who will not be enrolled in any other course work for the semester.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit

**NCLC 494 - Service-Learning Experience**

Credits: 1-15 (RT)  
Service-learning courses offer students, faculty, and community partners an opportunity to work together to integrate and apply knowledge to address community needs. Learning goals, action strategies, and assignments developed collaboratively. Students demonstrate progress through critical reflection that illustrates growth in acquiring and comprehending values, skills, and knowledge content. Critical reflection may take the form of papers, presentations, portfolios, journals, and exams.

**Hours of Lecture or Seminar per week:** 1-15  
**Hours of Lab or Studio per week:** 0
NCLC 495 - Field-Based Work

Credits: 1-18 (RT)
Directed field studies in topic not otherwise available to students.

Notes: Topics vary, but entire course or significant component is located off campus. In addition to field work, course may also include reading assignments, tutorials, lectures, papers, presentations, portfolios, journals, and exams. Students bear costs of required field trips and should consult Center for Field Studies for more information.

Hours of Lecture or Seminar per week: 1-15
Hours of Lab or Studio per week: 0

NCLC 496 - Teaching Assistant Experience

Credits: 1-6 (RD)
Teaching assistantship and peer-mentoring duties carried out through existing university programs, such as technology assistants, writing tutors, and residence advisors. Also includes teaching assistantship arrangements for specific courses detailed in individualized course contract signed by instructor and student. In addition to peer mentoring/advising, course work may include logistical support, reading assignments, papers, presentations, and portfolios.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

NCLC 497 - Add-On Experiential Learning

Credits: 1-3 (RT)
For students who wish to add one or more experiential learning credit to existing experiential learning course or learning community.

Prerequisite(s): Must be enrolled in a learning community or experiential learning class to add this additional credit.

Notes: May also be used by students who wish to add an experiential learning component to course that provides no experiential learning credit (with permission of instructor). Unless experiential learning add-on requirements are spelled out in course syllabus, requirements for add-on experiential learning credit must be detailed in individualized course contract signed by instructor and student.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

NCLC 498 - Field-Based Work

Credits: 1-15 (RT)
Experiential-based individualized studies, mentored by instructor.

Notes: Topics decided by student and instructor and approved by associate dean. Requirements must be detailed in individualized course contract signed by student, instructor, and associate dean. May include reading assignments, papers, journals, and exams.
NCLC 504 - Leadership Theory, Praxis, and Development

Credits: 3 (NR)
Explores contemporary leadership theories, models, and concepts using a theory-to-practice-to theory framework. Covers leadership theory, supporting research, and practical application. Focuses on active learning through classroom presentations, course texts, a reflection on theory and practice, and team work.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

NCLC 510 - Institutional Records Keeping

Credits: 3 (NR)
Offers students the theory and mechanics of animal records-keeping and identifies the important role accurate records play in successful captive management. Instruction is in the new ISIS Zoological Information Management System (ZIMS) Application, with hands-on training to learn about the capacity of ZIMS for use as a complete information management system.

Prerequisite(s): Admission to MAIS ZAL concentration or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 511 - Career Development

Credits: 3 (NR)
Focuses on traditional and industry-specific nonprofit management topics ranging from marketing to education. It is one of a series of three management courses for MAIS ZAL students.

Prerequisite(s): PUAD 505 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 512 - Organizational Development
Credits: 3 (NR)
Covers traditional zoo and aquarium organization topics, strategic planning, human resources, leadership styles, crisis management, and personal ethics. It is one of a series of three management courses for MAIS ZAL students.

Prerequisite(s): NCLC 511

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 513 - Population Management I: Data Acquisition and Processing

Credits: 3 (NR)
Teaches students to collect, process, and enter data into the studbook computer software program PopLink. Introduces basic principles of captive population management and how to use the studbook data to describe the history of the population as well as the natural history of the species in zoo and aquarium collections.

Prerequisite(s): Admission to MAIS ZAL program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 514 - Population Management II: Data Analysis and Breeding Recommendations

Credits: 3 (NR)
Educates students to be competent population managers with the ability to manage the genetic health of captive populations in zoos and aquariums.

Prerequisite(s): NCLC 513 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 515 - Information Technology for Zoos and Aquariums

Credits: 3 (NR)
Examines opportunities and best practices for leading and managing zoos and aquariums in the information age. Includes connecting zoo strategy and technology strategy; developing IT governance; and utilizing technology to further animal care, enhance operations, connect to patrons and increase revenues. Specific applications include zoological information systems, back office enterprise systems, GIS, eCommerce, and social media.

Prerequisite(s): Graduate or graduate non-degree standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
NCLC 520 - Conservation Education

Credits: 3 (NR)
Provides students with a comprehensive view of best practice and an understanding of pedagogical reform necessary to provide excellence in modern zoo and aquarium education. Focuses on public education and K-12 program development.

Prerequisite(s): Admission to MAIS ZAL program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 522 - Developing an Institutional In Situ Conservation Strategy

Credits: 3 (NR)
Educates students about the process and disciplines necessary to facilitate the professional development of an institutional in situ conservation strategy. Teaches students key components of a successful institutional conservation strategy. Presents model for strategy development that can be used as a guide to develop institutionally specific strategies.

Prerequisite(s): Admission to MAIS ZAL program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NCLC 523 - Managing Animal Enrichment and Training Programs

Credits: 3 (NR)
Provides students with skills to develop and/or enhance their zoo or aquarium’s enrichment and training programs. Specifically, the goal of the course is to provide the leadership skills and structural framework needed to create and maintain successful enrichment and training programs.

Prerequisite(s): Admission to MAIS ZAL program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
Grading: Graduate Special

NCLC 531 - Principles of Elephant Management

Credits: 3 (NR)
Train students to be competent elephant managers through understanding and application of behavioral science, reproductive physiology, population genetics, and conflict resolution.

Prerequisite(s): Admission to MAIS ZAL concentration or permission of instructor.
NCLC 565 - Independent Study in Zoo and Aquarium Leadership

Credits: 1-3 (RD)
Study of a topic not otherwise available to the student. May involve any combination of reading assignments, tutorials, lectures, papers, presentations, or field/laboratory study. Requires course contract sign by instructor and NCC dean.

Notes: May be repeated for a maximum of 6 credits when topic is different.

NCLC 595 - Experiential Learning

Credits: 1-3 (RT)

NCLC 625 - Online Library Research for the Zoo and Aquarium Professional

Credits: 3 (NR)
Examines methods and resources used to conduct effective research online. Topics include searching library research databases, locating full text articles and books, citation management, and the ethical use of information. Students develop their understanding of the expectations of the scientific method and ethical conduct among zoo and aquarium professionals through the discussion of relevant case studies.

Nursing (NURS)

Offered by the Health and Human Services

NURS 305 - Application of Basic Nursing Techniques

Credits: 1 (NR)
To be taken fall semester of accelerated second degree program. Introduces basic nursing technologies, and provides opportunities to apply these skills in simulated technology lab.

Prerequisite(s): Acceptance into accelerated second degree pathway.
NURS 309 - Introduction to Basic Nursing Care

Credits: 3 (NR)
Enrollment restricted to second-degree students only. Introduces basic fundamentals of nursing care across the life span. Emphasis on nursing process, critical thinking, and foundational technologies and skills required to practice in the health care setting.

Prerequisite(s): Acceptance into accelerated nursing pathway.
Corequisite(s): NURS 310

Notes: Enrollment restricted to second-degree students only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 310 - Application of Basic Nursing Care

Credits: 3 (NR)
Application of basic nursing care in acute care settings utilizing the nursing process.

Prerequisite(s): Acceptance into accelerated second degree program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 9

NURS 312 - Basic Nursing Care of Adults

Credits: 4 (NR)
Provides the student the opportunity to practice health assessment and fundamental nursing skills with adult medical/surgical clients, including those who are culturally diverse, vulnerable, and experiencing physiological, psychological, and social health problems.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 12
When Offered: Fall

NURS 319 - Pathophysiological Basis for Nursing Care of Individuals and Small Groups
Focuses on pathophysiological, psychological, sociocultural, and risk-reduction factors related to nursing care for clients with psychiatric conditions, as well as for child-bearing women, infants, children, and adolescents with acute health care needs.

Prerequisite(s): Acceptance into accelerated nursing pathway.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

NURS 330 - Nursing Fundamentals

Credits: 3 (NR)
Introduces nursing process and communication skills as the foundation for beginning health assessment and fundamental nursing care for culturally diverse individuals throughout the life span.

Prerequisite(s): Acceptance into traditional nursing pathway.

Corequisite(s): NURS 331.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

NURS 334 - Nursing as a Health Profession and Discipline

Credits: 3 (NR)
Introduces nursing as a dynamic and caring health profession, the impact of epidemiology, health promotion, and disease prevention on health status of culturally diverse and vulnerable individuals, families, small groups, and communities throughout life span. Incorporates nursing and critical thinking processes as they apply to the art and science of nursing. Historical perspectives on ethical, legal, political, and social issues are included.

Prerequisite(s): Acceptance into RN or accelerated nursing pathway.

Corequisite(s): NURS 309 and 310 for second-degree students only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

NURS 336 - Concepts in Professional Nursing as a Discipline

Credits: 3 (NR)
Provides an analysis of the profession and explores nursing philosophies and theories. Explores legal, ethical, political, and technological issues in health care at various nursing levels. Addresses critical thinking and its application to the collaborative nursing process. Utilizes the American Psychological Association formatting style for professional writing within the nursing profession.
Notes: Must be admitted to the RN-to-BSN program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

NURS 337 - Applied Nursing Fundamentals and Health Assessment

Credits: 1 (NR)
Opportunity to practice health assessment and fundamental nursing technologies while using communication skills with culturally diverse and vulnerable populations in a variety of settings.

Prerequisite(s): Junior standing.

Corequisite(s): NURS 330 and 331

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2
Grading: Satisfactory/No Credit

NURS 343 - Pharmacology

Credits: 3 (NR)
Covers principles of pharmacokinetics, pharmadynamics of selected drug classifications, and nursing responsibilities related to drug administration to individuals throughout life span.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 344 - Intermediate Nursing Technologies

Credits: 1 (NR)
Laboratory course to assist students in acquiring therapeutic nursing interventions. Technologies presented are asepsis and wound care, administration of medications including dosage calculations, and management of intravenous therapy.

Prerequisite(s): NURS 330, 331, 332, 337, 347, 357, 425.

Corequisite(s): NURS 341.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 2
Grading: Satisfactory/No Credit
When Offered: Spring

NURS 347 - Adult Pathophysiology and Nursing Care
Credits: 2 (NR)
Introduces changing health needs of culturally diverse and vulnerable populations. Focuses on nursing care; and pathophysiological, psychological, sociocultural, and risk reduction implications of frequently experienced health problems in the adult population.

Prerequisite(s): Acceptance into junior standing.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**NURS 348 - Maternal-Newborn Physiology, Pathophysiology, and Nursing Care**

Credits: 2 (NR)
Introduces normal and abnormal processes with maternal-infant clients including cultural diversity and vulnerable populations. Focuses on normal physiological, pathophysiological, psychological, sociocultural, risk reduction, and nursing care of these clients.

Prerequisite(s): Acceptance into junior standing.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**NURS 349 - Pediatric Pathophysiology and Nursing Care**

Credits: 2 (NR)
Focuses on changing health needs of culturally diverse and vulnerable populations. Includes nursing care, pathophysiological, psychological, sociocultural, and risk-reduction implications of frequently experienced health problems in pediatric population.

Prerequisite(s): Acceptance into junior standing.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**NURS 350 - Application of Nursing Care for Individuals and Small Groups**

Credits: 5 (NR)
Includes five weeks of clinical experience in each specialty area, with focus on obstetric and family nursing, pediatric, and psychiatric mental health nursing. Students may also follow selected clients in clinics or home situations. Clinical consists of two full days per week in acute-care agencies.

Prerequisite(s): NURS 334, 305, 309, 310, 319, and 425

Corequisite(s): NURS 351, 419, and 353.

Notes: Open to accelerated second degree students
NURS 351 - Application of Intermediate Nursing Technologies

Credits: 1 (NR)
Introduces intermediate nursing technologies and provides opportunities to apply these skills in simulated technology lab.

Prerequisite(s): NURS 309, 310, 319, 334, 425

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 2
Grading: Satisfactory/No Credit

NURS 358 - Health Promotion and Disease Prevention in Maternal/Infant Nursing

Credits: 2 (NR)
Provides the student an opportunity to perform nursing care to the maternal/infant client, including those who are culturally diverse and vulnerable, and experiencing physiological, psychological, and social health problems in a variety of settings.

Prerequisite(s): NURS 348
Corequisite(s): NURS 348
Notes: Enrollment is controlled.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 6

NURS 359 - Health Promotion and Disease Prevention in Pediatric Nursing

Credits: 2 (NR)
Provides the student an opportunity to perform nursing care to the pediatric client, including those who are culturally diverse and vulnerable, and experiencing physiological, psychological, and social health problems in a variety of settings.

Prerequisite(s): NURS 349
Corequisite(s): NURS 349
Notes: Enrollment is controlled.

Hours of Lecture or Seminar per week: 1-9
Hours of Lab or Studio per week: 6

NURS 388 - Problem-Based Clinical Inquiry
Credits: 3 (NR)
Focuses on analyzing clinical problems and attempts to resolve issues using critical thinking. Students examine the data in the cases, draw inferences, make deductions, identify assumptions, generate interpretations, evaluate weakness and strengths of arguments, and document their findings.

Prerequisite(s): Completion of NURS 425, 330, 331, 332, 337, and one junior-level clinical course (NURS 357, 358, or 359)

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

NURS 410 - Nursing Care of Clients with Pathological Conditions

Credits: 3 (NR)
Encompasses complex health problems of culturally diverse and vulnerable populations throughout the life span. Focuses on nursing care needs and pathophysiological, psychological, and sociocultural implications of complicated health problems.

Prerequisite(s): Completion of all junior year nursing courses

Corequisite(s): Completion of computer NCLEX review required to fulfill course requirements

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

NURS 419 - Pathophysiological Basis for Nursing Care of Individuals and Small Groups II

Credits: 3 (NR)
Enrollment restricted to second degree students only. Focuses on pathophysiological, psychological, sociocultural, and risk reduction factors related to nursing care of child-bearing women, infants, children, and adolescents experiencing acute health care problems.

Prerequisite(s): NURS 305, 309, 310, 319, 334, 425.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 425 - Comprehensive Health Assessment

Credits: 3 (NR)
Open only to RNs and LPNs. Introduces systematic health assessment across the life span, and expands that knowledge base to include knowledge and skills necessary to perform comprehensive health assessments with culturally diverse and vulnerable populations.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2
When Offered: Fall, Spring
NURS 427 - Advanced Technologies for the Accelerated Pathway

Credits: 1 (NR)
Advanced technology course developing knowledge base related to acquisition of advanced skills in nursing practice. Refinement of assessment skills associated with selected advanced technologies integrated into this laboratory course.

Prerequisite(s): NURS 305, 309, 319, 334, 350, 351, 419, 425, 436, 440, 453.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2
Grading: Satisfactory/No Credit

NURS 428 - Community Health Clinical for the Accelerated Pathway

Credits: 2 (NR)
Clinical experience with a focus on collaborative nursing care with individuals, families, and large groups in the community. Emphasis on health promotion and disease prevention for well populations, and community-based care for individuals and families with acute and chronic illness.

Prerequisite(s): NURS 436 and 440.

Hours of Lecture or Seminar per week: 1-9
Hours of Lab or Studio per week: 6

NURS 429 - Preceptorship for the Accelerated Pathway

Credits: 3 (NR)
Opportunity to deliver collaborative nursing care to culturally diverse and vulnerable populations.

Prerequisite(s): NURS 309, 310, 320, 343, 419, and 436.

Notes: Concentrated clinical experiences available in selected institutional settings.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 9

NURS 434 - Vulnerable Populations

Credits: 3 (NR)
Focuses on the care of vulnerable and aging populations. Students will examine health disparities, health literacy, and multicultural issues that impact the delivery of health care. Students will analyze health care policies and health care delivery models that offer potential interventions for the identified needs of these populations.

Prerequisite(s): Completion of General Education requirements.
Corequisite(s): Completion of NURS 334 as pre or co-requisite.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

NURS 436 - Leadership and Management of Health Care

Credits: 3 (RD)
Introductory course in the leadership and management of health-related organizations. Reviews administrative issues in health-related services with particular emphasis on developing organizational strategies for effective interfacing of medical, nursing, allied health, and administrative staff.

Prerequisite(s): Completion of all junior year nursing courses

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

NURS 440 - Community Health and Epidemiology

Credits: 3 (RD)
Addresses population-focused health care. Emphasis is on primary, secondary, and tertiary prevention of health problems. Concepts of community, public health, and health policy affecting culturally diverse and vulnerable populations are examined.

Prerequisite(s): Senior standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

NURS 451 - Advanced Clinical Preceptorship

Credits: 5 (NR)
Opportunity to provide complex, collaborative nursing care to culturally diverse and vulnerable populations.

Notes: Concentrated clinicals available in selected institutional settings.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 15
When Offered: Fall, Spring

NURS 453 - Research in Nursing
Credits: 3 (RD)
Introductory research course designed to present basic concepts and methods of research. The research process is examined as a foundation for scholarship. Emphasis on critique and use of current nursing and research in clinical practice.

Prerequisite(s): STAT 250 or equivalent; acceptance into one of BSN nursing pathway.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 455 - Advanced Technologies in Nursing

Credits: 2 (NR)
Opportunity to acquire advanced skills in nursing practice. Refinement of assessment skills associated with selected advanced technologies integrated into this laboratory course.

Corequisite(s): NURS 451.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 4
Grading: Satisfactory/No Credit

NURS 457 - Introduction to Nursing Informatics

Credits: 3 (NR)
This introductory course focuses on the use of computer technology in nursing and healthcare. The student evaluates software applications and assesses the merit of health-related information on the Internet. Students will engage in projects aimed at solving patient care problems in a variety of technologically-enhanced health care settings.

Corequisite(s): Senior year

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

NURS 465 - Examination and Integration of Professional and Health Care Issues

Credits: 3 (NR)
Provides students with opportunities to examine issues in health care through reflection on the natural and behavioral sciences, humanities and other prerequisite coursework. Selected topics are examined through reading, writing and discussion. Formal and informal writing on issues is expected. Students receive written self-evaluation as well as formal review by peers and faculty members involved in teaching the course.

Fulfills general education requirement in synthesis.

Equivalent to HAP 465 (2011-2012 Catalog); HHS 465 (2010-2011 Catalog).

Prerequisite(s): Required General Education courses (including ENGL 302/ENGH 302).
NURS 466 - Community Health Nursing

Credits: 2 (NR)
This course addresses population-focused health care. Concepts of public health, epidemiology, environmental health, extended roles in nursing and health policy affecting culturally diverse and vulnerable populations are examined.

Prerequisite(s): Completion of all junior year nursing courses

NURS 467 - Clinical in Community Health Nursing

Credits: 2 (NR)
Clinical experience with a focus on collaborative nursing care with individuals, families, and large groups in the community. Emphasis is on health promotion and disease prevention for well populations and community-based care for individuals and families with acute chronic diseases.

Prerequisite(s): NURS 410, 436, 466
Corequisite(s): NURS 442, 466

NURS 468 - Psychiatric and Mental Health Nursing

Credits: 2 (NR)
Focuses on the nursing care, pathophysiological and psychological, social-cultural, and risk reduction implications of health problems in the area of mental health and psychiatric nursing.

Prerequisite(s): Completion of all junior year nursing courses

Notes: Open to traditional and LPN students only.

NURS 469 - Clinical in Psychiatric and Mental Health Nursing
Clinical experience with a focus on collaborative nursing care with individuals, families, and large groups in the community. Emphasis is on health promotion and disease prevention for well populations and community-based care for individuals and families with acute chronic diseases.

Prerequisite(s): NURS 410, 436

Corequisite(s): NURS 442, 468

Notes: Open to traditional and LPN students only.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 6

NURS 488 - Inquiry-Based Clinical Seminar

Credits: 2 (NR)
Students focus on a selected client they have provided care for during their NURS 451 clinical preceptorship. Students examine the data in the case, draw inferences, make deductions, identify assumptions, and generate interpretations regarding the client's problems. The class will participate as a group in the inquiry process to identify strengths and weaknesses of the arguments presented.

Prerequisite(s): Completion of junior-level nursing courses, NURS 410 and NURS 436

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

NURS 491 - Critical Thinking and Analysis of Test Taking Strategies

Credits: 2 (RD)
Increases test-taking abilities and improves critical-thinking skills related to nursing situations. Also guides the student to analyze and organize content to assist in decision making about nursing interventions. With faculty supervision, students work independently based on their learning needs.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

NURS 492 - Death, Dying, and Decision Making

Credits: 3 (NR)
Interdisciplinary examination and analysis of clinical care of dying and psychosocial issues related to death and dying. Special emphasis on applying ethical principles in resolution of complex problems for individuals with life-threatening illnesses and their families as caregivers or decision makers. Decision-maker models provide basis for clinical case discussions. Questions of futility examined with associated care issues. Current professional and lay literature discussed in context of socially changing norms and mores. Explores hospice and alternative palliative care models, and reviews policies, laws, and regulations that affect caregivers and health service providers. Includes advance directives, do-not-resuscitate orders, and assisted suicide. Presents bereavement as
part of death, dying, and grieving process.

**Notes:** Lecture-discussion.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 495 - Directed Reading in Nursing**

Credits: 1-2 (RT)  
Examines literature on specialized topic in nursing practice, education, or scholarship. Readings conducted in consultation with faculty.

**Prerequisite(s):** Senior status or permission of school.

**Notes:** May be repeated for a maximum of 4 credits.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

**NURS 496 - Violence in Today's Society**

Credits: 3 (NR)  
Examines magnitude of problem of violence globally and more specifically within the United States. Discussion and reflective activities engage students in the learning process.

Equivalent to GCH 496

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 499 - Independent Study in Nursing**

Credits: 1-3 (RT)  
Provides individual study of a particular problem area in nursing research, theory development, or education under the direction of faculty. Clinical practice may be arranged.

**Prerequisite(s):** Permission of instructor and Assistant Dean for the Undergraduate Program.

**Notes:** May be repeated for maximum 6 credits.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 0

**NURS 505 - Case Management**
NURS 508 - Psychopharmacology

Credits: 3 (NR)
Surveys therapeutic effects and side effect profiles of psychopharmacological drugs including psychotropic and recreational drugs. Emphasizes understanding mechanisms of actions, drug interactions, and subject variables influencing drug effects.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 509 - Introduction to Emergency Nursing

Credits: 3 (NR)
Introduces emergency-care nursing, focusing on relevant pathophysiological disease processes, diagnostics, medical therapeutics and relevant technology as applied to emergency nursing. Focuses on care of multicultural clients across the life span, as well as the patient-family unit of care. Addresses collaboration and triage, as well as legal, ethical, and psychosocial issues. Course based on core curriculum of the Emergency Nursing Association (ENA)

Prerequisite(s): Admission to graduate program

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 513 - Advanced Pharmacology in Nursing

Credits: 3 (NR)
Does not meet requirements for nurse practitioner majors, but may be taken as an elective. Provides knowledge of physiologic responses and pharmacokinetic principles of pharmacologic agents that will undergird the student's learning of advanced pharmacologic concepts. Topics include advanced pharmacokinetic principles, pharmacotherapeutics of single and multiple drug regimens, client education needs, special population needs, and legal requirements for prescriptive authority.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 514 - Advanced Health Assessment Methods
Credits: 1 (NR)
Expands on undergraduate skills in systematic health assessment across the life span. Teaches application of advanced health assessment skills in specialty advanced nursing practice setting. Integration of skills and techniques in collecting health assessment data towards appropriate decision making, clinical assessments, and therapeutic interventions in select population emphasized.

**Prerequisite(s):** Undergraduate-level health assessment course for degree credit or approved CEU course.

**NURS 530 - Nurses as Writers**

Credits: 3 (NR)
Focuses on theories and practices related to writing in nursing. Researching, composing, revising, and editing practiced in a variety of writing styles.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**NURS 546 - Leadership Strategies in Health Policy**

Credits: 3 (NR)
Examines the leadership process from a policy and organizational perspective to expand students' ability to impact the health policy-making process.

Equivalent to GCH 546

**Prerequisite(s):** Graduate standing or permission of instructor

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**NURS 550 - Pathophysiologic Bases for Major Health Deviations of Individuals**

Credits: 3 (NR)
Examines health deviations occurring in people in the United States that require long-term or terminal health care interventions. Deviations are presented within a developmental framework as they influence physiologic integrity at the cellular level. Focus is on man as a whole, open system. Complex health programs from the perspective of maintaining homeodynamics are examined.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**NURS 556 - Principles of Assessment and Evaluation in Nursing Education**
Credits: 3 (NR)

Presents techniques of assessment, measurement, and evaluation of nursing knowledge and skills in classroom and clinical settings. Provides opportunities for the informal assessment of learning; formal construction, analysis, and evaluation of tests; and evaluation of standardized tests. Examines the current research and the legal and ethical principles related to assessment and evaluation in nursing education.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 557 - Introduction to Clinical Genetics in Health Care**

Credits: 3 (NR)

Focuses on human clinical genetics including basic Mendel genetics; cytogenetics; molecular genetics; genetic disease, diagnosis, testing, and screening. Discusses central principles and impact of Human Genome Project on health care practice in terms of ethical and legal issues, including genetic testing and counseling.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 570 - Cultural Dimension of Aging**

Credits: 3 (NR)

Examines the impact of cultural definitions of aging, research methodologies, and findings of crosscultural studies. Implications for health care and nursing are explored.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 571 - HIV/AIDS: Concepts, Principles, and Interventions**

Credits: 3 (NR)

Provides overview of all aspects of HIV disease to include retrospective and current concepts and analyses of the epidemic, global, and societal impact, and cutting-edge research. Examines development of therapeutic tools and skills to educate, reduce risks, control infection, and affect care and healing of client, family, and community; and issues of increasing dilemma for health care professionals.

Equivalent to GCH 571

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 580 - Operating Room - RN First Assistant**
Credits: 3 (NR)
Prepares the experienced operating room nurse to become a registered nurse first assistant. Modeled after the official AORN RNFA core curriculum. Student receives hands-on practice in knot tying and suturing, as well as experience with microscope and endoscopy labs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 585 - Entrepreneurship in Health Care

Credits: 3 (NR)
Overview of models of entrepreneurship in health care. Provides opportunities for collaborative problem solving to support business development, entrepreneurial behavior, and leadership. Explores innovative approaches to and alternatives for nursing practice and health care delivery.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 587 - Parish Nursing II

Credits: 3 (NR)
Students must be registered nurses. Focuses on skill development in spiritual assessment, ethical decision making, and effective use of prayer. Emphasizes health promotion, working with volunteers, and utilizing community resources. Self-care and professional identity for the parish nurse are addressed. Students continue the processes of case consultation and spiritual formation.

Prerequisite(s): NURS 586.

Notes: Students must be registered nurses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 594 - Special Topics in Nursing

Credits: 1-3 (NR)
Presents selected topics analyzing specialized areas in nursing.

Equivalent to GCH 594/HAP 594

Notes: Content varies. Lecture, seminar, laboratory, workshop.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
NURS 595 - RN to MSN Transition: Evidence Based Community Health Nursing

Credits: 3 (NR)
Initial course in RN to MSN Pathway. Introduces concepts of community health nursing with evidence-based focus. Students apply concepts to selected communities; demonstrate an understanding of health promotion and disease prevention; explore role of master's prepared nurses; and complete 45 hours of clinical practicum to achieve course objectives.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1

NURS 605 - Clinical Nurse Educator Academy

Credits: 3 (NR)
Integrates knowledge and skills from clinical practice with new knowledge and skills needed as a clinical nurse educator. Narratives are used to teach essential skills for clinical nurse educators, such as assessment of learning needs, writing of objectives, teaching strategies, clinical simulation, and performance evaluation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 611 - Anthropology of Health

Credits: 3 (NR)
Explores cross-cultural issues of health and illness from medical anthropology theory. Discusses cultural dimensions of developmental cycle and health care systems.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 613 - Advanced Health Assessment

Credits: 2 (NR)
The course expands on undergraduate skills in systematic health assessment across the life span. The student will learn advanced health assessment skills in specialty advanced nursing practice. Integration of skills and techniques in collecting health assessment data towards appropriate decision-making, clinical assessments and therapeutic interventions in select populations is emphasized in this lab and didactic course.

Prerequisite(s): Undergraduate-level Health Assessment course for degree credit.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

NURS 618 - Pathophysiology: Health and Illness
Focuses on the biological and pathophysiological foundations of health problems. Biological changes in selected health problems and health risks, will be used as a framework for critically appraising assessment data and to advance nursing strategies.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 620 - Advanced Psychiatric/Mental Health Nursing**

Credits: 3 (NR)  
Build on basic psychiatric and mental health nursing knowledge and skills in assessment, diagnosis, therapeutic intervention, and management. Focuses on enhancing fundamental roles of psychiatric or mental health advanced practice nurse, including practice, teaching, consultation, supervision, and research in relation to clients and their families.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 623 - Clinical Concepts in Community-Oriented Primary Care**

Credits: 3 (NR)  
Theoretical and clinical application of community-oriented primary care concepts with focus on health promotion and disease prevention. Examines scope of practice of advanced practice nurse practitioner. Students work with interdisciplinary groups to improve health indicators for populations.

**Prerequisite(s):** NURS 665.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 3

**NURS 630 - Acute Care Nursing for Advanced Practice**

Credits: 3 (NR)  
Focuses on acute-care nursing for advanced practice with individuals and their families diagnosed with potentially life-threatening alterations in health. Emphasizes risk factors, physical symptoms, evidence-based interventions, functional capacity, and patient and family dynamics; and psychosocial, economic, and cultural factors and their impact on care.

**Prerequisite(s):** Admission to the graduate program or permission of the instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 632 - Pathogenesis of Mental Disorders**
Explores biological correlates of mental illness, including neuronal function, structure and connectivity, and peripheral alterations in biological functioning that contribute to mental disorders across the lifespan. Reviews genetic heritability and specific theories of etiology and diagnostic classifications. Develops interview and differential diagnostic skills.

Prerequisite(s): Admission to the Doctor of Nursing Practice program or with permission of instructor.

Notes: Required course in Psychiatric Mental Health Nurse Practitioner (PMHNP) or Clinical Nurse Specialist (PMHCNS) concentrations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**NURS 633 - Individual Psychotherapy**

Credits: 3 (NR)
Explores major approaches to individual psychotherapy such as psychodynamic, humanistic, interpersonal, behavioral, cognitive, dialectical behavioral, brief, crisis, and multicultural therapies as they relate to advanced nursing practice in mental health. Applications of individual psychotherapies across the lifespan and among diverse populations are critically examined.

Prerequisite(s): Admission to the Doctor of Nursing Practice program or with permission of instructor; NURS 632.

Notes: Required course in Psychiatric Mental Health Nurse Practitioner (PMHNP) or Clinical Nurse Specialist (PMHCNS) concentrations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**NURS 634 - Group, Family and Couple Psychotherapy**

Credits: 2 (NR)
Explore the major psychotherapeutic approaches for groups, families, and couples. Emphasis is placed on the application of theories and models of group, family, and couple psychotherapy across the lifespan and among diverse populations.

Prerequisite(s): Admission to the Doctor of Nursing Practice program or with permission of instructor; NURS 632.

Notes: Required course in Psychiatric Mental Health Nurse Practitioner (PMHNP) or Clinical Nurse Specialist (PMHCNS) concentrations.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Spring

**NURS 643 - Community-Oriented Primary Care**
Credits: 3 (NR)
Theoretical and clinical application of community-oriented primary care concepts with a focus on health promotion and disease prevention.

Prerequisite(s): Admission to MSN or DNP Program or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 3
When Offered: Fall, Summer, Spring.

NURS 645 - Gerontological Nursing 1

Credits: 3 (NR)
Provides content related to nursing care of older adults with emphasis on advanced practice and issues relevant to improved health care of the elderly. Focuses on biological, psychological, and sociocultural elements that influence the aging process, and onset of age-related illnesses.

Prerequisite(s): NURS 680 and 688.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 646 - Gerontological Nursing 2

Credits: 3 (NR)
Builds on content in NURS 645, and focuses on health care deviations and nursing interventions in advanced gerontological nursing practice. Age-related illnesses and common disorders are discussed in the context of health behaviors, healthy adaptation, cultural sensitivity, developing appropriate coping strategies, and family, community and nursing supports.

Prerequisite(s): NURS 645.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 648 - Aging and Health

Credits: 3 (NR)
Provides an overview of normal aging and explores factors that affect health and well being in older adults; demonstrates strategies for maintaining health and managing chronic illness in older adults; examines common misconceptions about aging and healthcare issues; and explores the process of normal aging and the presentation of common health conditions in older adults.

Equivalent to HHS 648

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall
**NURS 650 - Healthcare and Law**

Credits: 3 (NR)
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**NURS 654 - Nursing Administration Financial Management**

Credits: 3 (NR)
Investigates managerial technologies related to financial planning and control functions of mid-level nurse administrators. Content develops knowledge and skills necessary for effective participation in financial management as related to business plan development, program budget planning, and control.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**NURS 660 - Seminar in the Ethics of Health Care**

Credits: 3 (NR)
Examines moral dilemmas in the health care profession, with special emphasis on patients' rights, professionals' obligations to other professionals, and issues of social justice in health care. Methods of moral deliberation based on ethical knowledge and justification are applied to ethical dilemmas in health care.

Equivalent to PHIL 510

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**NURS 665 - Theoretical and Ethical Foundations Related to Nursing**

Credits: 3 (NR)
Selected nursing and related discipline theories which impact nursing practice are analyzed and evaluated with special attention given to ethical aspects of practice and ethical decision-making frameworks. Moral dilemmas in the health care profession, with emphasis on patients’ rights, professionals’ obligations to other professionals, issues of social justice in health care, and methods of moral deliberation are examined.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**NURS 680 - Theoretical Foundations Related to Nursing**
Examination and evaluation of assumptions, concepts, and propositions inherent in selected nursing and related discipline theories.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**NURS 685 - Advanced Nursing Research Methods**

Credits: 3 (NR)
Examines principles and methods of research in problem identification, theoretical framework, design, data collection, and analysis. Students develop a nursing research proposal.

Prerequisite(s): Admission to graduate nursing program and a bivariate statistics course and NURS 680.

Corequisite(s):

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**NURS 686 - Projects in Nursing Research**

Credits: 2 (NR)
Applies knowledge gained in NURS 790 to implement research proposal designed in NURS 790.

Prerequisite(s): NURS 685.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**NURS 688 - Organization of Nursing and Health Care Delivery Systems**

Credits: 3 (NR)
Provides foundational overview of U.S. nursing and health care delivery systems. Surveys key concepts, frameworks, processes, and structures related to health care delivery organizations.

Prerequisite(s):

Notes: Lecture, discussion.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**NURS 690 - Independent Study in Nursing**
Credits: 1-3 (RD)
Studies in-depth a selected area of nursing theory, research, or practice under direction of faculty.

Prerequisite(s): Admission to graduate nursing program, and permission of associate dean for academic programs.

Notes: May be repeated; maximum 6 total credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

NURS 704 - Nursing Administrative Leadership Academy

Credits: 3 (NR)
Uses a leadership competency framework to integrate knowledge, skills, values, and best practices of innovative nursing leadership. Lectures, interactive collaborative discussion, written projects, and leadership self-assessment identify and teach the proficiencies specific to the administrative executive role.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 713 - Decision Making and Pharmacologic Management in Practice

Credits: 2 (NR)
Analyzes clinical cases using student participation in decision-making formulation. Correlates pathophysiology with symptom manifestations across the lifespan, from prenatal to old age, including death. Evaluates family, medical and social history, physical findings, laboratory data and radiographic studies as they contribute to the decision making process. Examine the theoretical basis for selecting pharmacological and non-pharmacological therapies is explored.

Prerequisite(s): Admission to MSN or DNP Program Nurse Practitioner Concentration.

Corequisite(s): NURS 769; NURS 761.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

NURS 714 - Health Assessment in Clinical Practice

Credits: 2 (NR)
Application of advanced health assessment skills that includes all body systems and clinical decision making with clients across the lifespan. Students will formulate differential diagnoses and explore advanced communication techniques related to motivating and changing health behaviors. Students will apply advanced skills and techniques in a supervised lab setting.

Prerequisite(s): Admission to MSN or DNP Program or permission of instructor.

Hours of Lecture or Seminar per week: 2
NURS 715 - Nursing Informatics Inquiry

Credits: 3 (NR)
This course introduces theoretical and practice components of nursing and healthcare informatics for the graduate level nurse. Computer systems will be analyzed. The systems life cycle will be explored. Health care data standards, classification schemes, and the electronic health record (EHR) will be introduced. Students will evaluate informatics as it applies to patient safety, outcomes measurement, complex decision-making, consumer use, and legal and ethical issues.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 719 - Advanced Health Assessment

Credits: 2 (NR)
Application of advanced health assessment skills and clinical decision making with adults of all ages in primary care settings. Students formulate differential diagnosis related to body systems and presenting signs and symptoms. Students explore communication techniques related to motivating and changing health behaviors. The performance of skills and techniques needed to collect data for comprehensive health assessment is emphasized in this supervised practicum by nurse practitioner preceptors.

Notes: Course meets at George Washington University. Students receive a George Mason bill, but tuition is calculated at the George Washington University rate. Contact department for specific meeting dates and information.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 4

NURS 720 - Practicum in Family Primary Care Nursing I

Credits: 4 (NR)
Performance of beginning-level nurse practitioner clinical decision-making skills in assessment and management of families and individuals across the life span, with emphasis on health maintenance and health promotion. Seminar, lab, and clinical practicum.

Prerequisite(s): NURS 719, 723, 745, 747, 756.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6
Grading: Graduate Special

NURS 721 - Practicum in Assessment and Management of the Developing Family

Credits: 8 (NR)
Theoretical and clinical application of health assessment, health maintenance and promotion, anticipatory guidance, diagnosis,
and management of common primary health care concerns through clinical decision-making skills focused on childrearing and childbearing families. Seminar, lab, clinical practicum.

**Prerequisite(s):** NURS 720.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 15  
**Grading:** Graduate Special

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**NURS 722 - Practicum in Family Primary Care Nursing II**

Credits: 8 (NR)  
Students perform advanced clinical decision making in the role of family nurse practitioner. Family primary care problems throughout the life span are assessed and managed, particularly families with elderly and medically underserved members. Seminar, lab, and clinical practicum.

**Prerequisite(s):** NURS 720 and 721.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 5  
**Grading:** Graduate Special

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**NURS 723 - Clinical Decision Making**

Credits: 2 (NR)  
Course is offered through George Washington University and is charged at GWU tuition rates. Analyzes clinical cases using student participation in decision-making formulation. Correlates pathophysiology with symptom manifestations. Evaluates family, medical, and social history; physical findings; laboratory data; and radiographic studies as they contribute to the decision-making process. The theoretical basis for selecting pharmacological and nonpharmacological therapies is explored. Therapies are justified by examining the evidence to support them.

**Corequisite(s):** NURS 756 and 747.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

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**NURS 724 - Health Assessment Practicum**

Credits: 1 (NR)  
Demonstrates the ability to perform advanced health assessment skills that includes all systems across the lifespan. The student will perform advanced techniques and clinical decision making that is necessary for a comprehensive health assessment in this clinical practicum.

**Prerequisite(s):** Admission to MSN or DNP Program or permission of instructor.

**Corequisite(s):** NURS 714.
Notes: Five clinical hours are required per week for each credit. Required course in Nurse Practitioner concentration.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 5
When Offered: Fall, Summer, Spring.

NURS 725 - Hermeneutic Research Methodologies in Health Care

Credits: 3 (NR)
Uses seminar/discussion for in-depth exploration of interpretive phenomenology, philosophical background for hermeneutics, and hermeneutics as method in context of conducting research in health care. Uses readings from philosophers such as Heidegger, Merleau-Ponty, and Gadamer to situate hermeneutical methodologies in philosophy of science.

Prerequisite(s): Graduate-level qualitative research course

Corequisite(s): Graduate-level qualitative research course

NURS 726 - Perspectives in Nursing Education

Credits: 3 (NR)
Uses seminar approach to provide an overview of nursing education. Provides the foundation for teaching and learning in nursing with emphasis on relevant research.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 727 - Application of Nursing Education Principles to Curriculum and Program Development

Credits: 3 (NR)
Uses seminar and discussion forums to analyze and apply theoretical principles and teaching and learning strategies in planning, developing, and evaluating nursing programs. Examines the overall creative, planned, and collaborative process of program development and evaluation.

Prerequisite(s): NURS 726.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 728 - Practicum and Seminar in Nursing Education I
Credits: 3 (NR)
Uses seminar/discussion approach and practicum experience to analyze the role and functions of the nurse educator in the academic classroom. Emphasis is on the application of teaching/learning strategies, legal and ethical issues in nursing education, and role development as a nurse educator.

Prerequisite(s): NURS 514, 550, 726, and 727; NURS 556 or EDRS 531.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 6

**NURS 729 - Practicum and Seminar in Nursing Education II**

Credits: 3 (NR)
Uses seminar/discussion approach and practicum experience to analyze the role and functions of the nurse educator in the clinical setting. Application of research-based teaching and evaluation strategies in the clinical setting are emphasized.

Prerequisite(s): NURS 514, 550, 726, and 727; NURS 556 or EDRS 531.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 6

**NURS 730 - Leadership Strategies for the Clinical Nurse Leader**

Credits: 2 (NR)
Explores aspects of horizontal and vertical leadership central to clinical nurse leader (CNL) role. Emphasizes quality management and improvement, communication processes, evidenced-based practice initiatives in microsystem, and strategies for efficient use of resources while maintaining safe and effective patient care.

Prerequisite(s): NURS 597 and 685

Corequisite(s): NURS 597 and 685

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**NURS 733 - Introduction to Forensic Science**

Credits: 3 (NR)
Examines the introductory concepts of forensic science including the various professional roles of forensic scientists and practitioners. This course provides a broad overview of the forensic science profession. Different types of violence, as well as prevention and reduction strategies, are discussed. The forensic professional's role in policy and legal processes are explored. Forensic research is introduced. Professional certification options are explored.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
NURS 734 - Role of the Sexual Assault Nurse Examiner and Interpersonal Violence

Credits: 3 (NR)
Focuses on the incidence and consequences of interpersonal violence across the lifespan. Identifies the role of sexual assault nurse examiner (SANE) as a member of the Sexual Assault Response Team (SART). Examines forensic techniques used to collect evidence. The role of the SANE in the judicial process is explored.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 735 - Crime Lab and Crime Scene Investigation

Credits: 3 (NR)
Examines the components of the crime lab and the crime scene analysis process. Explores the role of the forensic scientist in crime scene investigation. This course covers the initial crime scene response and initial assessment measures needed to properly collect and handle evidence. Documentation and preservation efforts are reviewed for various types of evidence collected.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 736 - Psychological and Legal Aspects of Forensic Science

Credits: 3 (NR)
Evaluates the psychological and legal aspects of forensic science. Reviews victimology and the role of the forensic professional when dealing with victimized individuals. This course reviews various types of violence and identifies the assessment criteria needed to pursue prosecution. Examines the legal process and the role of the forensic professional in providing testimony in a court of law.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 737 - Investigation of Injury and Death

Credits: 3 (NR)
Explores the role of the forensic scientist in death investigation. Examines death, manners of death, and causes of death, along with the death certification process. The role of the medical office professional and autopsy procedures will be reviewed. DNA evidence and the CODIS system will be analyzed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 738 - Family Primary Care I
NURS 739 - Family Primary Care II

Credits: 4 (NR)
Theoretical application of health assessment, health maintenance/promotion, anticipatory guidance, diagnosis and management of common primary health care concerns through clinical decision making skills focused on childbearing and childbearing families. Seminar, student presentations and lectures.

Prerequisite(s): Students must be admitted to the Family Nurse Practitioner Program; NURS 738.

Corequisite(s): NURS 744

Notes: Required course in Family Nurse Practitioner concentration.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0
When Offered: Fall

NURS 740 - Clinical Nurse Specialist Internship

Credits: 3 (RT)
A continuation of clinical application of theory from NURS 775 to a selected clinical specialty with attention to the health illness continuum of individuals, families, and community.

Notes: This course may be taken twice.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 9

NURS 741 - Family Primary Care III

Credits: 3 (NR)
Theoretical application of assessment, diagnosis and management of primary health care problems which will enable the nurse...
practitioner student to assume increased responsibility in the delivery of primary care to families and individuals across the life span. Special emphasis is given to the primary care needs of families with elderly and medically underserved members. Seminar, student presentations and lectures.

**Prerequisite(s):** Students must be admitted to the Family Nurse Practitioner Program; NURS 739.

**Corequisite(s):** NURS 749

**Notes:** Required course in Family Nurse Practitioner concentration.

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0
- **When Offered:** Summer

### NURS 742 - Family Primary Care Practicum I

**Credits:** 3 (NR)

Demonstrates the ability to function at a beginning level in the role of the nurse practitioner. Performance of advanced skills in assessment and the development of plans for health maintenance and promotion for families with a focus on the adult. Clinical practicum, lab and seminar.

**Prerequisite(s):** Students must be admitted to the Family Nurse Practitioner Program.

**Corequisite(s):** NURS 738.

**Notes:** Five clinical hours are required per week for each credit. Required course in Family Nurse Practitioner concentration.

- **Hours of Lecture or Seminar per week:** 0
- **Hours of Lab or Studio per week:** 1-12
- **When Offered:** Summer

### NURS 743 - Clinical Psychopharmacology

**Credits:** 2 (NR)

Introduce psychotropic medications, including neurochemical basis, mode of action and clinical application. Discuss principles of pharmacological medication selection and use based on clinical indicators.

**Notes:** Required course in Psychiatric Mental Health Nurse Practitioner (PMHNP) or Clinical Nurse Specialist (PMHCNS) concentrations. Admission to the Doctor of Nursing Practice program or with permission of instructor.

- **Hours of Lecture or Seminar per week:** 2
- **Hours of Lab or Studio per week:** 0
- **When Offered:** Spring

### NURS 744 - Family Primary Care Practicum II
Clinical application of health assessment, health maintenance/promotion, anticipatory guidance, diagnosis and management of common primary health care concerns through clinical decision making skills focused on childrearing and childbearing families. Clinical practicum, seminar, lab.

Prerequisite(s): Students must be admitted to the Family Nurse Practitioner Program; NURS 738.

Corequisite(s): NURS 739

Notes: Five clinical hours are required per week for each credit.
Required course in Family Nurse Practitioner concentration.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
When Offered: Fall

**NURS 745 - Pharmacology**

Credits: 3 (NR)
Describes the pharmacologic principles and pharmacodynamic actions of major classes of drugs. Distinguishes between the major drug classes by the pharmacologic properties of the drugs on the cellular, organ, and whole organism level. Study of indications and contraindications of appropriate therapeutic entities for health deviations is based on a thorough knowledge of drugs including their mechanism of action, possible toxic effects, and their fate in the human body. Evaluation and recognition of drug interactions for the possible impact on each drug's therapeutic behavior, as well as on the body as a whole is emphasized. Chooses and interprets appropriate monitoring mechanisms for drug efficacy and toxicity.

Notes: Course is offered through George Washington University and charged at GWU tuition rates.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**NURS 746 - Practicum in Adult Primary Care Nursing I**

Credits: 6 (NR)
Demonstration of the ability to function at a beginning level in the role of the nurse practitioner. Performance of advanced skills in assessment and the development of plans for health maintenance and promotion for adults.

Prerequisite(s): NURS 719, 723, 745, 747, 756

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 12
Grading: Graduate Special

**NURS 747 - Pharmacology in Disease and Pathophysiology**

Credits: 1 (NR)
Analyze drugs and their interaction with physiologic processes on the cellular level. Discuss the therapeutic actions of drugs in
relationship to pathophysiologic states. Recognize those physiologic and pathophysiologic states that have direct consequences on the actions of drugs.

Corequisite(s): NURS 723 and 756.

Notes: Course is offered through George Washington University and charged at the George Washington University rate.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**NURS 748 - Practicum in Adult Primary Care Nursing II**

Credits: 8 (NR)
Enables nurse practitioner student to assume increased responsibility in the delivery of primary care to adults. Special emphasis on primary care needs of elderly and medically underserved groups.

Prerequisite(s): NURS 746.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 16
Grading: Graduate Special

**NURS 749 - Family Primary Care Practicum III**

Credits: 5 (NR)
This practicum enables the nurse practitioner student to assume increased responsibility in the delivery of primary care to families. Family primary care problems across the life span are assessed and managed, particularly families with elderly and medically underserved members. Practicum, clinical lab and seminar.

Prerequisite(s): Students must be admitted to the Family Nurse Practitioner Program; NURS 739.

Corequisite(s): NURS 741

Notes: Five clinical hours are required per week for each credit.
Required course in Family Nurse Practitioner concentration.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 5
When Offered: Spring

**NURS 752 - Advanced Family Primary Care**

Credits: 8 (NR)
Seminar and clinical practicum that focuses on the integration of the family nurse practitioner role through the application of family theory and concepts in primary care settings. Application of advanced critical thinking and decision making of family care needs and family systems is emphasized.
Prerequisite(s): NURS 751 and 753.

Notes: Taught through George Washington University Distance Learning. For advanced students in the Post Master Advanced Practice Nurse Practitioner Program.

Hours of Lecture or Seminar per week: 8
Hours of Lab or Studio per week: 0

NURS 753 - Diagnosis and Management of the Developing Family

Credits: 4 (NR)
Didactic and laboratory course focused on primary care needs of families. Integration of advanced health assessment, health maintenance and promotion, anticipatory guidance, and diagnosis and management of common primary care health concerns to advance the knowledge and skills of primary care nurse practitioner needs of family care as provided by family nurse practitioners.

Corequisite(s): NURS 751.

Notes: Taught through George Washington University Distance Learning. For students in the Post Master Advanced Practice Nurse Practitioner Program.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 6

NURS 754 - Advanced Adult Primary Care

Credits: 4 (NR)
Enables the post-master's nurse practitioner student to develop and assume increased responsibility in delivery of primary care to adults. Clinical preceptorship and instructional and informative didactic material in primary care enable students to demonstrate advanced skills in the assessment, clinical diagnostic, and clinical management of common acute and chronic primary care problems. Special emphasis to the development of community-based health promotion and disease prevention strategies with adults and medically underserved populations.

Prerequisite(s): NURS 719, 723, 745, 747, 756

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 9

NURS 756 - Advanced Pathology and Pathophysiology

Credits: 4 (NR)
Analyze health deviations in the physiologic and pathophysiologic aspects of systems functioning across the life span. Students assimilate the process of systematic assessment and management of health deviations foundational for making clinical decisions. Collaborate in interprofessional student groups to develop strategies for health promotion and disease prevention in vulnerable populations.

Corequisite(s): NURS 723 and 747.
Notes: Course is offered through George Washington University and charged at the George Washington University rate.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

NURS 757 - Nursing Research and Biostatistics I

Credits: 3 (NR)
Provides a broad framework for understanding and applying commonly used research designs and data analysis techniques in nursing and health care research. Exposed to an overview of qualitative and quantitative research methods integrated with appropriate data analyses techniques. Univariate and bivariate statistical techniques will be used to address research questions or hypothesis as appropriate.

Prerequisite(s): Admission to the graduate nursing program; Undergraduate Statistics Course

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 758 - Nursing Research and Biostatistics II

Credits: 3 (NR)
Empirically address practice related problems using complex bivariate and multivariate statistical analysis. Using an established data set as a basis for simulation of the research process, student will identify clinical problems in research traditions to provide evidence for nursing practice. Emphasis is on evaluating the quality of research for its strength as evidence for nursing practice.

Prerequisite(s): NURS 757

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 761 - Pharmacotherapeutics

Credits: 3 (NR)
Describes the pharmacologic principles and pharmacodynamic actions for all broad categories of agents. Distinguishes between the major drug classes by the pharmacologic properties of drugs on the cellular, organ and whole organism level. Study of indications and contraindications of appropriate therapeutic entities for health deviations based on a thorough knowledge of drugs and their fate in the human body.

Prerequisite(s): Admission to MSN or DNP Program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.
NURS 762 - Managed Care Concepts for Primary Care Practice

Credits: 1-4 (RD)
 Presents managed-care concepts specific to primary care practice through self-paced learning modules, seminars, and selected nondirect care internship experiences in managed care settings.

Prerequisite(s): Admission to the nurse practitioner program.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 3-12

NURS 763 - Administrative Theory in Nursing

Credits: 3 (NR)
 Uses administrative theory and management principles and processes as related to roles and functions of the nurse in management in health-related agencies.

Prerequisite(s): Admission to graduate nursing program or master's degree. NURS 680 and Management/Organizational Theory

Corequisite(s): NURS 680 and Management/Organizational Theory

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

NURS 765 - Practicum in Nursing Administration I

Credits: 3 (NR)
 Applies administrative theory and management principles and processes in a selected health-related agency. Roles and functions of the nurse in management are explored.

Prerequisite(s): Admission to graduate nursing program; NURS 680, 763

Corequisite(s): NURS 763

Notes: Lab arranged.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 8
When Offered: Fall

NURS 766 - Administrative Strategies in Nursing

Credits: 3 (NR)
 Explores roles and functions of the nurse in management as the nurse manager develops patterns of nursing care, articulating nursing education, and nursing service.
**Prerequisite(s):** NURS 763 and 765.

**Corequisite(s):** NURS 768.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**NURS 768 - Practicum in Nursing Administration II**

Credits: 3 (NR)  
Implements and integrates roles and functions of the nurse in management. Emphasizes using appropriate management principles and processes in a selected health-related agency.

**Prerequisite(s):** NURS 763, 765, 766  
**Corequisite(s):** NURS 766

**Notes:** Lab arranged.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 8  
**When Offered:** Spring

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**NURS 769 - Physiology and Pathophysiology in Advanced Practice**

Credits: 3 (NR)  
Analyze health deviations in the physiologic and pathophysiologic aspects of systems functioning across the life span. Students assimilate the process of systematic assessment and management of health deviations foundational for making clinical decisions.

**Prerequisite(s):** Admission to MSN or DNP or permission of instructor.

**Corequisite(s):** NURS 713

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

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**NURS 770 - Adult Primary Care I**

Credits: 3 (NR)  
Theoretical application of health assessment, health management/promotion, anticipatory guidance, diagnosis and management of common primary care health care concerns through clinical decision making skills focusing on adults. Lecture, student presentations and seminar.

**Prerequisite(s):** Students must be admitted to the Adult Nurse Practitioner Program.
Corequisite(s): NURS 772.

Notes: Required course in Adult Nurse Practitioner concentration.

NURS 771 - Adult Primary Care II

Credits: 4 (NR)
Theoretical application of assessment, diagnosis and management of primary health care problems which will enable the nurse practitioner student to assume increased responsibility in the delivery of primary care to adults. Special emphasis is given to the primary care needs of elderly and medically underserved groups. Lectures, student presentations and seminars.

Prerequisite(s): Adult Primary Care I.

Corequisite(s): Adult Primary Care Practicum II.

Notes: Students must be admitted to the Adult Nurse Practitioner Program. Required course in Adult Nurse Practitioner concentration.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0
When Offered: Fall

NURS 772 - Adult Primary Care Practicum I

Credits: 3 (NR)
Demonstrates ability to function at a beginning level in the role of the nurse practitioner. Performance of advanced skills in assessment and the development of plans for health maintenance and promotion for adults. Clinical practicum, lab and seminar.

Prerequisite(s): Students must be accepted to the Adult Nurse Practitioner program.

Corequisite(s): NURS 770.

Notes: Five clinical hours are required per week for each credit.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
When Offered: Fall

NURS 773 - Clinical Applications of Theory in Advanced Clinical Nursing

Credits: 3 (NR)
Foundational theory relevant to the emerging roles in advanced clinical nursing, focusing on therapeutic nursing interventions in
a variety of clinical specialties, with attention to health-illness continuum of individuals, families, and communities.

**Prerequisite(s):** Admission to graduate nursing program. NURS 550, 680.

**Corequisite(s):** NURS 550, 680.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**NURS 774 - Adult Primary Care Practicum II**

Credits: 4 (NR)  
Enables the nurse practitioner student to assume increased responsibility in the delivery of primary care to adults. Special emphasis is given to the primary care needs of elderly and medically underserved groups. Practicum, clinical lab and seminar.

**Prerequisite(s):** Students must be admitted to the Adult Nurse Practitioner Program; NURS 770.

**Corequisite(s):** NURS 771.

**Notes:** Five clinical hours are required per week for each credit. Required course in Adult Nurse Practitioner concentration.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 4  
**When Offered:** Spring

**NURS 775 - Advanced Specialty Practice I**

Credits: 3 (RT)  
Focuses on clinical application of theory from NURS 773 to a selected clinical specialty with attention to the health illness continuum of individuals, families, and communities.

**Prerequisite(s):** NURS 665.

**Corequisite(s):** NURS 768.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 7

**NURS 776 - Development of Advanced Practice Nursing Role**

Credits: 3 (NR)  
Expansion of selected content included in NURS 773 for the delivery of advanced nursing care in a variety of settings. Emphasizes development and evaluation of the advanced practice nursing role in complex health care systems.

**Prerequisite(s):** NURS 773.
NURS 778 - Advanced Specialty Practice II

Credits: 3 (NR)
Applies concepts of the advanced practice nursing role from NURS 776 to a selected clinical specialty.

Prerequisite(s): NURS 665.

Corequisite(s): NURS 773.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 7

NURS 780 - Practicum in Gerontological Nursing I

Credits: 3 (NR)
Demonstrates the ability to function at a beginning level in the role of the gerontological nurse practitioner. Performance of advanced skill in geriatric assessment with a special emphasis on the delivery of health promotion and disease prevention services (practicum of at least 100 clinical hours and case analysis conferences).

Prerequisite(s): NURS 719, 723, 745, 747, 756.

Corequisite(s): NURS 746.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
Grading: Graduate Special

NURS 781 - Practicum in Gerontological Nursing II

Credits: 3 (RD)
Demonstrates the ability to function at an advanced level in the role of the gerontological nurse practitioner in varied settings, including primary care, long-term care, and sub-acute care (practicum of at least 100 clinical hours and case analysis conferences).

Prerequisite(s): NURS 773 and 775.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
Grading: Graduate Special

NURS 782 - Family Psychiatric Nurse Practitioner Practicum I

**Prerequisite(s):** Admission to the Doctor of Nursing Practice program or with permission of instructor; NURS 632, NURS 633, NURS 634, and NURS 743.

**Corequisite(s):** NURS 783.

**Notes:** Five clinical hours per week are required for each credit.

Required course in the Family Psychiatric Mental Health Nurse Practitioner (FPMHNP) concentration. Admission to the Doctor of Nursing Practice program or with permission of instructor.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 20  
**When Offered:** Fall

### NURS 783 - Family Psychiatric Nurse Practitioner Seminar I

Credits: 1 (NR)  
Analyzes the professional role of family psychiatric mental health nurse practitioners. Students share assessment, diagnostic, intervention, evaluation, teaching-coaching, cultural competence, and therapeutic relationship development techniques through case studies from their practica. Management of client cases are evaluated and discussed. Students analyze the impact of advocacy actions, including duty to report, on the therapeutic relationship.

**Prerequisite(s):** Admission to the Doctor of Nursing Practice program or with permission of instructor; NURS 632, NURS 633, NURS 634, and NURS 743.

**Corequisite(s):** NURS 782.

**Notes:** Required course in the Family Psychiatric Mental Health Nurse Practitioner (FPMHNP) concentration. Admission to the Doctor of Nursing Practice program or with permission of instructor.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

### NURS 784 - Family Psychiatric Nurse Practitioner Practicum II

Credits: 5 (NR)  
Builds on Family Psychiatric Nurse Practitioner Practicum I, improving diagnostic and clinical reasoning ability and competence in assessment, diagnosis, and management of psychiatric disorders. Enables the student to assume increased responsibility in the delivery of comprehensive mental health care. Participates in professional and community organizations to promote the health of patients while enhancing the role of practitioner.
Prerequisite(s): Admission to the Doctor of Nursing Practice program or with permission of instructor; NURS 782.

Corequisite(s): NURS 785.

Notes: Five clinical hours per week are required for each credit.

Required course in Family Psychiatric Mental Health Nurse Practitioner (FPMHNP) concentration. Admission to the Doctor of Nursing Practice program or with permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 5
When Offered: Spring

NURS 785 - Family Psychiatric Nurse Practitioner Seminar II

Credits: 1 (NR)
Discuss role transition and development of advanced practice psychiatric mental health nurses. Regulatory and economic policies affecting advanced psychiatric mental health nursing practice in the evolving health care system are discussed. Students demonstrate competence in comprehensive management of acute and chronic psychiatric disorders through case presentations from their practica. Performs a comprehensive assessment of the mental health needs of a community.

Prerequisite(s): Admission to the Doctor of Nursing Practice program or with permission of instructor; NURS 783.

Corequisite(s): NURS 784

Notes: Required course in the Family Psychiatric Mental Health Nurse Practitioner (FPMHNP) concentration. Admission to the Doctor of Nursing Practice program or with permission of instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Spring.

NURS 804 - Advanced Quantitative Data Analysis for Health Care Research I

Credits: 3 (NR)
Examine factorial ANOVA, factorial ANCOVA, repeated measures ANOVA, ANOVA and ANCOVA via regression approach, and multiway frequency analysis. Students apply mathematical calculations and interpret SPSS outputs using health care research data.

Equivalent to GCH 804

Prerequisite(s): A graduate-level statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 805 - Advanced Quantitative Data Analysis for Health Care Research II
NURS 805 - Multivariate Statistics and Data Analysis for Health Care Research

Credits: 3 (NR)
Examines multivariate analysis of variance (MANOVA), multivariate analysis of covariance (MANCOVA), multiple regression (ordinary least squares), and logistic regression. Students apply mathematical calculations and use linear combinations of multivariate tests in health care research data.

Equivalent to GCH 805

Prerequisite(s): GCH/NURS 804 or an equivalent statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 806 - Advanced Multivariate Statistics and Data Analysis for Health Care Research

Credits: 3 (NR)
Examines canonical correlation, discriminant analysis, factor analysis, and causal analysis (path models and structural equation modeling). Students analyze and interpret data using these statistical techniques.

Equivalent to GCH 806

Prerequisite(s): GCH/NURS 805 or an equivalent multivariate statistics course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 807 - Measurement Theories and Applications in Health Care Research

Credits: 3 (NR)
Theories, principles, and techniques presented as foundation for the development and evaluation of instruments for use in health care research. Includes review of statistical techniques required for understanding measurement theory, reliability, validity, item analysis, and instrument construction. Students required to design, construct, administer, analyze, and evaluate an original instrument or evaluate an existing instrument in health care research.

Equivalent to GCH 807

Prerequisite(s): GCH/ NURS 805 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 808 - Translating Nursing and Health Care Research into Evidence-Based Policy

Credits: 3 (NR)
This course prepares students to assess the policy dimensions of nursing issues in clinical practice, education, and research environments and translate nursing research into policy.
NURS 809 - Research Design and Methods in Nursing and Health Care

Credits: 3 (NR)
Explore strategies for converting nursing and health care problems into research questions. Evaluate and apply quantitative and qualitative designs, measures and analysis strategies to various research questions.

Prerequisite(s): NURS 804 or equivalent advanced statistical course, NURS 955 or permission of instructor.

NURS 810 - Evaluation Research in Nursing Education

Credits: 3 (NR)
Uses seminar/discussion to analyze and apply theoretical models for implementing evaluation research in nursing education. Examines quantitative approaches for evaluating process and outcomes of domestic or international nursing education programs, including role of accreditation guidelines.

Prerequisite(s): NURS 920 and 930

Corequisite(s): NURS 920 and 930

NURS 811 - Nurse as Educator and Scholar

Credits: 2 (NR)
Uses seminar/discussion to explore role of nurse educator in meeting research and scholarship expectations of college, university, or service setting. Addresses approaches to scholarship in relation to types of evidence appropriate for various scholarly expectations in academic setting.

Prerequisite(s): NURS 920 and 930.

NURS 820 - Human Genetics Concepts for Health Care

Credits: 4 (NR)
The study of human genetics, principles of heredity, and disease risks.
NURS 870 - Nursing and Health Care Administration I

Credits: 3 (NR)
Examines the theoretical basis of scholarship and practice in leadership and management of health systems and nursing organizations. Includes discovery of concepts and forces influencing the organization and performance of health care systems.

Prerequisite(s): Admission to the PhD or DNP program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 871 - Nursing and Health Care Administration II

Credits: 2 (NR)
Analyzes and applies selected concepts related to nursing and health system leaders and managers as well as factors influencing the performance of health systems and organizations.

Prerequisite(s): NURS 870.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

NURS 874 - Internship in Health Care Administration/Policy/Education

Credits: 4 (NR)
Internship experience of at least 126 hours with leader in field of nursing, health care administration, policy, or education. Participatory activities require integration and application of principles, frameworks, and science related to executive preceptor role.

Prerequisite(s): Completion of all other course work except NURS 998; written advanced application and permission of instructor by due dates (April/November 1) in advance of semester.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 9

NURS 875 - Research Internship

Credits: 3 (NR)
Provides guided research experience of hours, during which students participate as a member of a research team engaged in scientific inquiry. Designed to enhance professional socialization in research scholarship at the doctoral level.
**Prerequisite(s):** Must have taken or be taking a doctoral level research course and, meeting these requirements, can take any semester prior to comprehensive exams.

**Corequisite(s):** A doctoral level research course.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 6  
**When Offered:** Fall, Spring

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**NURS 883 - Evidence-Based Practice in Nursing and Healthcare**

Credits: 4 (NR)  
Building on knowledge of research methodologies and personal expertise, student will identify practice and system problems, analyze the variations of processes and outcomes, evaluate research studies and systematic reviews, and develop a proposal to address issues related to the design of new model of care, translation of evidence into practice, or evaluation of current programs in the context of evidence-based practice. Emphasis is placed on the development of strategies to ensure quality improvement.

**Prerequisite(s):** NURS 757 and NURS 758

**Hours of Lecture or Seminar per week:** 4  
**Hours of Lab or Studio per week:** 0

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**NURS 920 - Qualitative Research in Nursing and Health Care**

Credits: 3 (NR)  
Examination and application of principles in qualitative research in nursing and health care. Qualitative research will be analyzed within the scholarship of discovery, integration, and application.

**Prerequisite(s):** NURS 955

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**NURS 921 - Clinical Practicum I**

Credits: 1-10 (NR)  
Students, in consultation with their academic advisor, complete supervised practicum hours to meet both the post-baccalaureate and post-masters DNP practicum requirement. A practicum course that prepares students to perform clinical decision making in their role as advance practice nurses in individualized specialty areas. They will work with advanced practice nurse preceptors to develop clinical expertise, and to develop an understanding of leadership roles in the clinical setting that can enhance the system of health care delivery. One credit hour of seminar with the remaining hours in clinical practice.

**Hours of Lecture or Seminar per week:** 1-10  
**Hours of Lab or Studio per week:** 0
**NURS 922 - Clinical Practicum II**

Credits: 1-10 (RD)

Students, in consultation with their academic advisor, complete supervised practicum hours to meet both the post-baccalaureate and post-masters DNP practicum requirement. A practicum course that continues to prepare students to practice in an expanded, advanced clinical practice role. Students will learn to become change agents in the clinical setting with a focus on health care delivery systems. The student will apply advanced health assessment skills and clinical decision making in an area of specialty practice, correlating pathophysiology with symptom manifestations. One credit hour of seminar with the remaining hours in clinical practice.

Hours of Lecture or Seminar per week: 1-10  
Hours of Lab or Studio per week: 0

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**NURS 925 - Methodological Issues in Nursing and Health Care Qualitative Research**

Credits: 3 (NR)

Explores, analyzes, and synthesizes conceptual, methodological, and ethical issues in qualitative research within the scholarship of discovery, integration, application, and teaching. Seminar.

Prerequisite(s): NURS 920/HSCI 920 or equivalent course, and permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

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**NURS 930 - Quantitative Methods in Nursing and Health Care**

Credits: 3 (NR)

Examination and application of principles in quantitative research in nursing and health care. Computer analysis of quantitative data will be required.

Prerequisite(s): NURS 955, 804, and 805.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

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**NURS 940 - Independent Study for the Doctoral Student**

Credits: 1-6 (NR)

Studies in depth a selected area of nursing theory, research, or practice under direction of faculty.

Prerequisite(s): Admission to a doctoral nursing program.

Hours of Lecture or Seminar per week: 1-6  
Hours of Lab or Studio per week: 0
NURS 950 - Special Topics in Nursing

Credits: 3 (NR)
Presents selected topics analyzing specialized areas in nursing. Content varies. Lecture, seminar, laboratory, workshop.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 955 - Philosophical Bases of Inquiry

Credits: 3 (NR)
Philosophical bases of discipline and practice of health-related disciplines are examined within scholarship of discovery, integration, application, and teaching. Compares nursing and health science philosophy with relevant related discipline philosophies.

Prerequisite(s): Admission to nursing or other doctoral program or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

NURS 957 - Ethics of Health Care Research

Credits: 3 (NR)
Provides a firm foundation for understanding and promoting responsible conduct of research. The ethical principles that govern research design and methodology with subjects including vulnerable populations will be critically analyzed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

NURS 980 - Practice Inquiry I

Credits: 4 (RD)
Synthesize the literature related to the problem. Analyze the environmental factors impacting the problem. Identify the standard of care related to the clinical problem. Assess the quality of evidence that supports the standard of care. Develop a proposal that will impact the delivery of care in the identified area of practice inquiry. Develop the appropriate outcome measures to address the specific practice inquiry area.

Prerequisite(s): Completion of DNP core courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

NURS 981 - Practice Inquiry II
Implement the proposal developed in Practice Inquiry I. Maintain an ongoing process analysis of the project. Collect data. Analyze the findings from the practice inquiry. Disseminate the findings from the practice inquiry in a scholarly manner.

**Prerequisite(s):** NURS 980.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 2

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**NURS 998 - Doctoral Dissertation Proposal**

Credits: 1-9 (RD)  
A seminar for doctoral students to accompany the development of a doctoral dissertation proposal. Development of the research problem with analysis and critique of methodology discussed.

**Prerequisite(s):** Completion of all other course work except NURS 999; and completion of doctoral comprehensive examination.

**Notes:** Students must enroll in the course for 3-credits the first time they take the course.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit  
**When Offered:** Fall, Spring

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**NURS 999 - Doctoral Dissertation**

Credits: 1-9 (RT)  
Provides continued faculty assistance on an individual basis toward completion of approved dissertation.

**Prerequisite(s):** NURS 998.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit

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**Nutrition (NUTR)**

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**NUTR 295 - Nutrition for Health Professionals**

Credits: 3 (NR)  
Introduces nutrition science, emphasizing macro- and micronutrients in body, digestion, energy metabolism, weight loss, fitness and nutrition, prevention of chronic diseases, nutrition therapy, and nutritional assessment. Problem-solving and critical-thinking methodologies used in group presentations that address nutrition-related case studies. In-class activities, outside readings, and
class discussion reinforce concepts. Students use computer-based diet analysis to evaluate personal dietary intakes.

Equivalent to GCH 295 (2010-2011 Catalog)

Prerequisite(s): One semester of science or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

NUTR 408 - Introduction to Food Security

Credits: 3 (NR)
Examines the human health aspects of food security at the local, regional, and global levels.

Prerequisite(s): NUTR 295.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer, Spring

NUTR 420 - Strategies for Nutrition Education

Credits: 3 (NR)
Examines methods and techniques for educating individuals about nutrition. Addresses nutrition education issues from variety of populations with respect to culture, age, religion, and specific disease states.

Equivalent to GCH 420 (2010-2011 Catalog)

Prerequisite(s): NUTR 295 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

NUTR 421 - Community Nutrition

Credits: 3 (NR)
Focuses on nutrition and health problems of specific community settings, and examines practices of nutrition services in various communities.

Equivalent to GCH 421 (2010-2011 Catalog)

Prerequisite(s): NUTR 295 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

NUTR 422 - Nutrition throughout the Life Cycle

Credits: 3 (NR)
Focuses on nutrient needs and food habits throughout life cycle. Emphasizes nutrient needs prior, during, and after pregnancy, and nutritional requirements of infants, children, adolescents, adults, and elderly.

Equivalent to GCH 422 (2010-2011 Catalog)

Prerequisite(s): NUTR 295 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Summer

NUTR 423 - Nutrition and Chronic Illnesses

Credits: 3 (NR)
Examines nutrient needs related to specific chronic illnesses, including cardiovascular disease, cancer, obesity, and diabetes. Focuses on principles of nutritional therapy and prevention.

Equivalent to GCH 423 (2010-2011 Catalog)

Prerequisite(s): NUTR 295 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

NUTR 466 - Nutrition and Weight Management: Obesity, Anorexia, and Bulimia

Credits: 3 (NR)
Focuses on the physiological, emotional, genetic, and societal and cultural factors that influence the relationship between eating and weight regulation.

Equivalent to GCH 466 (2010-2011 Catalog)

Prerequisite(s): NUTR 295, GCH 332, or approval of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer
NUTR 502 - U.S. Role in Global Health, Nutrition, and Population

Credits: 3 (NR)
The course will cover U.S. history in responding to health, nutrition, and population challenges worldwide; examine current programs in each area, including those of the U.S. government and nongovernmental organizations, foundations, and the private sector; and examine future directions for responding to health, nutrition, and population trends.

Equivalent to GCH 502 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

NUTR 520 - Introduction to Wine and Beer

Credits: 3 (NR)
Multidisciplinary approach to understanding beer and wine across time and space. Emphasis is on the fundamentals of wine and beer production as well as the social and cultural dimensions of alcohol. Students must be 21 to enroll in the course.

Equivalent to GCH 520 (2010-2011 Catalog)

Notes: Will include off campus field trips.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

NUTR 566 - Nutrition and Weight Management

Credits: 3 (NR)
Focuses on the physiological, emotional, genetic, and societal/cultural factors that influence the relationship between eating and weight regulation.

Equivalent to GCH 566 (2010-2011 Catalog)

Prerequisite(s): GCH 295 or other introductory nutrition course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

NUTR 583 - Biocultural Perspectives on Food and Nutrition

Credits: 3 (NR)
Examines food and eating behaviors, diet, and nutrition from cross-cultural perspective. Focuses on how and why people choose what to eat, range and significance of cross-cultural variability in diet, how diets have changed, and health and social implications
of those changes. Lecture, discussion, video presentations, audiovisual aids, student presentations, and case study analyzes.

Equivalent to GCH 583 (2011-2012 Catalog)

Prerequisite(s): GCH 295 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

NUTR 594 - Special Topics in Nutrition and Food Studies

Credits: 3 (RD)
In-depth study of contemporary areas of nutrition and food studies. Topics vary each semester. Students may take up to 6 credits of NUTR 594 within their degree program.

Prerequisite(s): Graduate level course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Summer, Spring.

NUTR 608 - Perspectives on Food Security

Credits: 3 (NR)
Overview of the major concepts and perspectives of food security. Explores and applies the definitions, means of measurement, and policy implications of food security from a multidisciplinary approach.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

NUTR 610 - Food Safety and Defense

Credits: 3 (NR)
Focuses on the possible sources of unintentional and intentional contaminations in the food supply, and on the roles and guiding policies of the various levels of government and the food industry, as well as individual responsibility, in managing risk to ensure a safe food supply.

Prerequisite(s): NUTR 608.

Notes: Fees may apply.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.
NUTR 611 - Food and Nutrition Security Policy

Credits: 3 (NR)
In-depth analysis of food security and nutrition policies and programs aimed at reducing hunger and malnutrition among individuals and populations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring.

NUTR 630 - Global Nutrition

Credits: 3 (NR)
Directed at students from a variety of disciplines, this course examines what malnutrition is and how it occurs by looking at several situations from around the world. It looks at the impact of nutrition on a society and community and examines the benefits of a well-nourished population.

Equivalent to GCH 530 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

NUTR 751 - Nutritional Assessment, Monitoring, and Surveillance

Credits: 3 (NR)
Introduces students to methods and tools used in assessing nutritional status and the practice and application of these to monitoring among individuals and population groups. Methods of interpretation of nutrition-related information will be examined.

Equivalent to GCH 751 (2010-2011 Catalog)

Prerequisite(s): NUTR 630 or approved graduate nutrition course.

Notes: Will include off campus practice.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

Operations Management (OM)

Offered by the School of Management
If a student takes noncore, upper-level business courses before admission to SOM, those courses will not count on an undergraduate degree application for any major in the school, except as general elective credit. A grade of C or higher must be presented on the graduation application for each upper-level course in the major. Course prerequisites are strictly enforced. Degree status is defined as formal admission to BS degree status in SOM.

OM 210 - Statistical Analysis for Management

Credits: 4 (NR)

Introduces application of statistical methods to support quantitative decision analysis for resolving business problems. Topics include descriptive statistics, probability distributions, statistical inference and regression. May be taught in lecture/recitation format. Students may not receive credit for both OM 210 and OM 211.

Equivalent to OM 211

Prerequisite(s): C or higher in MATH 108, MATH 113, HNRS 125, HNRT 125, or HNRT 225. Prerequisite enforced by registration system.

Corequisite(s): MIS 102.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

OM 211 - Honors Statistical Analysis for Management

Credits: 4 (NR)

Introduces the application of statistical methods to support quantitative decision analysis for resolving business problems. Topical coverage includes descriptive statistics, probability, random variables, probability distributions, sampling and sampling distributions, estimation, hypothesis testing, and linear regression (both simple and multiple). Requires extensive use of case studies to integrate, synthesize and extend the concepts presented in order to foster a "learning by doing" approach that develops and promotes critical thinking abilities. Active class discussions via individual and/or group presentations of case assignments is an important learning activity. Extensive use of computer software for statistical modeling, problem solving, and analysis of case studies is a significant component of this course.

Equivalent to OM 210

Prerequisite(s): Cumulative GPA of 3.5 or higher; B or higher in MATH 108, MATH 113, HNRS 125, HNRT 125, or HNRT 225. Prerequisite enforced by registration system.

Corequisite(s): MIS 102.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
OM 301 - Operations Management

Credits: 3 (NR)

Examines an organization's operations, including design, management and improvement processes, projects and supply chains, in both product and service environments. Uses analytical models to support key planning and control activities. School of Management students will not be permitted to make more than three attempts to achieve a C or higher in OM 301. Those who do not successfully complete this course within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the "Termination from the Major" section under Academic Policies.

Prerequisite(s): C or higher in OM 210. Sophomore standing. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

OM 320 - Supply Chain Management and E-Business

Credits: 3 (NR)

Design, development, and management of supply chain systems, including production and inventory management, distribution channels, and information systems that support them. Emphasizes impact of e-business on companies and industries, including Internet's impact on the way goods and services flow through value chain from providers to customers.

Prerequisite(s): C or higher in OM 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

OM 352 - Methods and Models of Management Science

Credits: 3 (NR)

Introduces operation research and management sciences (OR/MS) techniques for supporting business management decisions. Specific mathematical programming and probabilistic topics include linear programming, integer programming, goal programming, network flow models, decision analysis, game theory, queuing models, and Monte Carlo simulation.

Prerequisite(s): C or higher in OM 301, degree status. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

OM 435 - Business Process Analysis and Simulation
Introduces concepts and tools used in designing, modeling, analyzing, and improving business processes. Various business process analysis and simulation methods, such as process mapping/flowcharting, process flow and capacity analysis, service process design, theory of constraints, process modeling and simulation, and business process reengineering are discussed. Introduces methods and analytical tools such as queue theory and computer simulation used to design, model, analyze, and improve business processes. Discusses methods such as process mapping/diagramming, service process design, process modeling, and business process reengineering.

Prerequisite(s): C or higher in OM 301, degree status. Prerequisite enforced by registration system.

OM 452 - Business Forecasting

Introduces techniques for producing predictions of future business operations as aids to making planning decisions. Specific topics include judgmental forecasting, forecast accuracy, correlation analysis, smoothing methods, regression models, decomposition, and autoregressive and ARIMA models. Methods demonstrated and used through computer software.

Prerequisite(s): C or higher in OM 301, degree status. Prerequisite enforced by registration system.

OM 456 - Quality Management

Provides an understanding of the multifaceted nature of quality management by emphasizing topics such as quality philosophies, total quality management, design quality, process quality, and managing quality in information systems development. Discusses ISO 9000 and Capability Maturity Model. Uses software, case studies.

Prerequisite(s): C or higher in OM 301, degree status. Prerequisite enforced by registration system.

OM 462 - Honors Seminar in Operations Management

Topic and format vary. In-depth study of a topic in the area of operations management. Enrollment limited and competitive.

Prerequisite(s): Degree status in ISOM major; senior standing; permission of department.
OM 491 - Seminar in Operations Management

Credits: 3 (NR)
Analyzes selected topics that highlight latest developments in the operations management field, including contemporary research findings and case studies of operations management in business and other organizations.

Prerequisite(s): C or higher in OM301, degree status. Prerequisite enforced by registration system.

OM 493 - Management of Technology Projects

Credits: 3 (NR)
Focuses on managerial problems associated with meeting technical, cost, and time constraints of technology projects. Discusses project management areas including organization, teams, scheduling, cost control, earned value analysis, risk management, and quality. Includes software cost estimation models and the management of IT projects. Software and case studies.

Prerequisite(s): C or higher in OM 301, degree status. Prerequisite enforced by registration system.

OM 499 - Independent Study in Operations Management

Credits: 1-3 (RT)
By special arrangement with instructor, and approval from associate dean for undergraduate programs. Investigates business problem according to student interest, using state-of-the-art decision science methodology.

Prerequisite(s): C or higher in OM 301, degree status. Prerequisite enforced by registration system.

Operations Research (OR)

Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.
OR 335 - Discrete Systems Modeling and Simulation

Credits: 3 (NR)
Introduction to basic concepts of modeling complex discrete systems by computer simulation. Topics include Monte-Carlo methods, discrete event modeling, specialized simulation software, and statistics of input and output analysis.

Equivalent to SYST 335

Prerequisite(s): CS 211 or grade of C or better in IT 206 or equivalent; and STAT 344, or STAT 346, or MATH 351, or grade of C or better in STAT 250.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

OR 441 - Deterministic Operations Research

Credits: 3 (NR)
Survey of deterministic methods for solving real-world decision problems. Covers linear programming model and simplex method of solution, duality, and sensitivity analysis; transportation and assignment problems; shortest path and maximal flow problems; and introduction to integer and nonlinear programming. Emphasizes modeling and problem solving.

Equivalent to MATH 441

Prerequisite(s): MATH 203, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

OR 442 - Stochastic Operations Research

Credits: 3 (NR)
Survey of probabilistic methods for solving decision problems under uncertainty, probability review, decision theory, queuing theory, inventory models, reliability, Markov chain models, and simulation are covered. Emphasis on modeling and problem solving.

Equivalent to MATH 442

Prerequisite(s): STAT 344 or STAT 346 or MATH 351, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring
OR 481 - Numerical Methods in Engineering

Credits: 3 (NR)
Modern numerical methods and software. Emphasis on problem solving through software and assessing the quality of solutions obtained. Topics include computer arithmetic, linear equations and least squares data fitting, interpolation, nonlinear optimization, and differential equations. Involves extensive computer use.

Equivalent to MATH 446

Prerequisite(s): MATH 213 or 215, and MATH 203 or 322; or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

OR 498 - Independent Study in Operations Research

Credits: 1-3 (NR)
Directed self-study of special topics of current interest in operations research.

Prerequisite(s): 60 credits; must be arranged with instructor and approved by department chair before registering.

Notes: May be repeated for maximum 6 credits if topics substantially different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

OR 540 - Management Science

Credits: 3 (NR)
Operations research techniques and their application to managerial decision making. Mathematical programming, Markov processes, queuing theory, inventory models, PERT, CPM, and computer simulation are covered, as well as use of contemporary computer software for problem solving. Case-study approach to problem solving is used.

Equivalent to SYST 540

Prerequisite(s): MATH 108, and STAT 250 or OM 200; or equivalent.

Notes: Students who have taken OR 541 or OR 542 and OR MS majors do not receive credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

OR 541 - Operations Research: Deterministic Models
Survey of deterministic methods of solving real world decision problems. Covers linear programming model and simplex method of solution, duality, and sensitivity analysis, transportation and assignment problems; shortest path, minimal spanning tree, and maximal flow problems; and an introduction to integer and nonlinear programming. Emphasis on modeling and problem solving.

Prerequisite(s): MATH 203 or equivalent.

Notes: Students who have taken OR 441/MATH 441 will not receive credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 542 - Operations Research: Stochastic Models

Credits: 3 (NR)

Prerequisite(s): STAT 344 or MATH 351, or equivalent.

Notes: Students who have taken OR 442/MATH 442 do not receive credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 574 - Quality Control and Process Management

Credits: 3 (NR)
An overview of quality control techniques widely used in a number of manufacturing industries. The course teaches students about combining engineering process quality management and traditional statistical quality control procedures that are applicable in industry and are based on contemporary technologies such as lean Six Sigma, total quality management and predictive maintenance for achieving superior quality, reliability and maintainability.

Equivalent to SYST 574

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 576 - Manufacturing Systems Analysis

Credits: 3 (NR)
An overview of modeling and analysis of general manufacturing systems techniques widely used in a number of manufacturing industries, such as semiconductor manufacturing. The course teaches students about best scheduling
and inventory control practices, enterprise resource management principles, and details of engineering economy that are applicable in the industry.

Equivalent to SYST 576

**Prerequisite(s):** Graduate standing or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### OR 588 - Financial Systems Engineering I: Introduction to Options, Futures, and Derivatives

Credits: 3 (NR)  
This course is an introduction to financial engineering. Financial engineering is a cross-disciplinary field which relies on mathematical finance, numerical methods, and computer simulations to make trading, hedging, and investment decisions. This course will introduce basic types of derivatives, such as forward, futures, swaps, and options; as well as financial models such as Brownian motion, Ito's formula, and Black-Scholes model.

Equivalent to SYST 588.

**Prerequisite(s):** Eng. or Math Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

### OR 604 - Practical Optimization

Credits: 3 (NR)  
Survey of optimization methods for students whose main focus is on application of optimization. Covers modeling, search methods, convexity, linear programming, sensitivity, networks, multiobjective optimization, heuristic methods, integer programming, nonlinear programming and dynamic programming; use of modeling languages and optimization tools, including NEOS.

**Prerequisite(s):** 6 credits of calculus and graduate standing, or permission of instructor.

**Notes:** Course cannot be counted toward MSOR degree. Students who have taken OR 541 or 644 cannot receive credit.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### OR 635 - Discrete System Simulation

Credits: 3 (NR)  
Computer simulation as a scientific methodology in operations analysis, with emphasis on model development, implementation,
and analysis of results. Discrete-event models, specialized software, input modeling, and output statistics are covered. Extensive computational work is required.

Prerequisite(s): OR 542, or STAT 354 or 344, or equivalent; and knowledge of scientific programming language.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 640 - Global Optimization and Computational Intelligence

Credits: 3 (NR)
Introduction to global optimization of nonconvex mathematical programs and numerical methods for the solution of such problems. Topics covered include high-level survey of traditional mathematical programming algorithms; critical comparison of metaheuristics and artificial intelligence (AI) algorithms to traditional mathematical programming algorithms; probabilistic search, multistart methods, statistical tests of performance and confidence, simulated annealing, genetic algorithms, neural networks, Tabu search, homotopies and tunneling; the traveling salesman problem, the Steiner problem, Stackelberg-Cournot-Nash mathematical games and other classical nonconvex optimization problems.

Prerequisite(s): MATH 203 or equivalent, and knowledge of a scientific programming language.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 641 - Linear Programming

Credits: 3 (NR)
In-depth look at the theory and methodology of linear programming: Computational enhancements of the revised simplex method; sparse-matrix techniques, bounded variables and the dual simplex method. Alternative interior point methods described and computational complexity of various algorithms analyzed.

Prerequisite(s): OR 541, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

OR 642 - Integer Programming

Credits: 3 (NR)
Cutting plane and enumeration algorithms for solution of integer linear programs; bounding strategies and reformulation techniques; heuristic approaches to the solution of complex problems; knapsack problems, matching problems, set covering and partitioning problems; applications to problems in OR/MS, such as capital budgeting, facility location, political redistricting, engineering design, and scheduling.

Prerequisite(s): OR 541, or permission of instructor.
OR 643 - Network Modeling

Credits: 3 (NR)
Introduction to network problems in operations research, computer science, electrical engineering, and systems engineering. Solution techniques for various classes of such problems are developed. Topics include minimal-cost network flow, maximal flow, shortest path, and generalized networks; plus stochastic networks, network reliability, and combinatorially based network problems. Complexity of each problem class analyzed.

Prerequisite(s): OR 541, or permission of instructor.

OR 644 - Nonlinear Programming

Credits: 3 (NR)
Nonlinear optimization theory and techniques applicable to problems in engineering, economics, operations research, and management science. Covers convex sets and functions, optimality criteria and duality; algorithms for unconstrained minimization, including descent methods, conjugate directions, Newton-type and quasi-Newton methods; and algorithms for constrained optimization, including active set methods and penalty and barrier methods.

Prerequisite(s): MATH 213 or equivalent, and OR 541; or permission of instructor.

OR 645 - Stochastic Processes

Credits: 3 (NR)
Selected applied probability models including Poisson processes, discrete- and continuous-time Markov chains, renewal and regenerative processes, semi-Markov processes, queuing and inventory systems, reliability theory, and stochastic networks. Emphasis on applications in practice as well as analytical models.

Equivalent to STAT 645

Prerequisite(s): OR 542 or STAT 544, or permission of instructor.
OR 647 - Queuing Theory

Credits: 3 (NR)
Unified approach to queuing, organized by type of model. Single- and multiple-channel exponential queues; Erlangian models, bulk and priority queues, networks of queues; general arrival and/or service times; and statistical inference and simulation of queues are covered. Extensive use of computational software.

Prerequisite(s): OR 542, STAT 544, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

OR 649 - Topics in Operations Research

Credits: 3-6 (RT)
Advanced topic chosen according to interests of students and instructor from dynamic programming, inventory theory, queuing theory, Markov and semi-Markov decision processes, reliability theory, decision theory, network flows, large-scale linear programming, nonlinear programming, and combinatorics.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for maximum 6 credits if topics are substantially different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 651 - Military Operations Research I: Cost Analysis

Credits: 3 (NR)
While drawing on other disciplines (managerial accounting, econometrics, systems analysis), cost analysis uses operations research to assist decision makers in choosing preferred future courses of action by evaluating selected alternatives on the basis of their costs, benefits, and risks. Cost analysis is distinctly different from cost estimating in that projecting future courses of action almost always requires mathematical modeling. Topics include analysis overview, economic analysis, estimating relationships (factors, simple and complex models), acquiring and verifying cost data, cost progress curves, life-cycle costing, scheduling estimating, effectiveness and risk estimation, relationship of effectiveness models and measures to cost analysis.

Corequisite(s): OR 541 or 542.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

OR 652 - Military Operations Research Modeling II: Effectiveness Analysis
Credits: 3 (NR)
Examines issues and modeling underlying military decisions at the Military Service, Joint Staff, and Department of Defense level. Analytical methods with applications to theater campaign analysis, equipment and weapon system modernization, force structure development, strategic mobility and deployment, small-scale contingency operations, logistics, and requirements determination are considered. Optimization, simulation, and statistical techniques are stressed. Realistic problems presented and solved as case studies. Display of results and presentation techniques for military decision makers emphasized.

Corequisite(s): OR 541 or 542.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

OR 660 - Air Transportation Systems Modeling

Credits: 3 (NR)
Introduces range of current issues in air transportation, including public policy toward the industry, industry economics, system capacity, current system modeling capability, human factors considerations, safety analysis and surveillance systems, and new technological developments. Students expected to develop broad understanding of contemporary and future issues. Knowledge evaluated through class discussions, a take-home midterm exam and a term project to be completed by the end of the semester.

Equivalent to SYST 660

Prerequisite(s): SYST 460/560, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

OR 671 - Judgment and Choice Processing and Decision Making

Credits: 3 (NR)
How do people make judgments and decisions? Course presents an initial review of scientific literature directed toward answering this question, and emphasizes its importance when performing decision analysis and designing systems to support judgment and decision processes.

Equivalent to SYST 671

Prerequisite(s): STAT 344/354.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

OR 674 - Dynamic Programming
Course on the theory and practice of dynamic programming, i.e., optimal sequential decision making over time in the presence of uncertainties. Stresses intuition, the mathematical foundations being for the most part elementary. Introduces the theory, applications (finance, engineering, and biology), and computational aspects of dynamic programming for deterministic and stochastic problems.

Equivalent to SYST 674

Prerequisite(s): OR 442 or OR 542 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 675 - Reliability Analysis

Credits: 3 (NR)
Introduction to component and system reliability, their relationship, and problems of inference. Topics include component lifetime distributions and hazard functions, parameter estimation and hypothesis testing, life testing, accelerated life testing, system structural functions, and system maintainability.

Equivalent to SYST 675

Prerequisite(s): STAT 544 or 554, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 677 - Statistical Process Control

Credits: 3 (NR)
Introduces concepts of quality control and reliability. Acceptance sampling, control charts, and economic design of quality control systems are discussed, as are system reliability, fault-tree analysis, life testing, repairable systems, and the role of reliability, quality control and maintainability in life-cycle costing. Role of MIL and ANSI standards in reliability and quality programs also considered.

Equivalent to STAT 677/SYST 677

Prerequisite(s): STAT 544 or 554, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 681 - Decision and Risk Analysis

Credits: 3 (NR)
Application of analytic reasoning and skills to practical problems in decision-making. Topics include problem structure, analysis and solution implementation, emphasizing contemporary approaches to decision analytic techniques.
OR 682 - Computational Methods in Engineering and Statistics

Credits: 3 (NR)
Numerical methods have been developed to solve mathematical problems that lack explicit closed-form solutions or have solutions that are not amenable to computer calculations. Examples include solving differential equations or computation probabilities. Discusses numerical methods for such problems as regression, analysis of variance, nonlinear equations, differential and difference equations and nonlinear optimization. Applications in statistics and engineering are emphasized. Involves extensive computer use.

Equivalent to CSI 700

Prerequisite(s): MATH 203 and 213 or equivalent, and modern numerical methods and software.

OR 683 - Principles of Command, Control, Communications, Computing, and Intelligence (C4I)

Credits: 3 (NR)
Fundamental principles of C4I are developed from descriptive, theoretical, and quantitative perspectives. Principles and techniques applicable to wide range of civilian and military situations. Topics include C2 process; modeling and simulation for combat operations; detection, sensing, and tracking; data fusion and situation assessment; optimal decision making; methodologies and tools of C4I architectures; tools for modeling and evaluations of C4 systems such as queuing theory.

Equivalent to SYST 680/ECE 670

Prerequisite(s): ECE 528, OR 542, or SYST 611; or equivalent.

OR 688 - Financial Systems Engineering II: Derivative Products and Risk Management

Credits: 3 (NR)
Financial engineering is a cross-disciplinary field which relies on mathematical finance, numerical methods, and computer simulations to make trading, hedging, and investment decisions, as well as facilitating the risk management of those decisions.
This course will focus on risk management for both market risk and credit risk. It will cover a broad range of derivatives products and hedging strategies with emphasis on how risks are managed in financial institutions.

Equivalent to SYST 688.

Prerequisite(s): OR/SYST 588 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

OR 690 - Optimization of Supply Chains

Credits: 3 (NR)
Focuses on both supply chain optimization from an enterprise-wide perspective, and supply chain optimization from a business-to-business e-commerce concern. Concerned with optimizing the value of goods and services and assuring a reasonable return on such sales. Describes both heuristic and exact algorithms for scheduling, production, inventory management, logistics, and distribution. New software that enables such optimization is presented, as are manufacturing and service examples from the public and private sectors. New techniques to handle risk, quality of data, and robustness of solutions are presented. Students perform case studies using state-of-the-art software.

Prerequisite(s): Graduate standing, mathematics through linear algebra, and STAT 344.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 699 - Masters Project

Credits: 3 (NR)
Capstone project course for MS/OR program. Key activity is completion of a major applied team project resulting in an acceptable technical report and oral briefing. Student should plan to take this course in the last semester of studies.

Equivalent to OR 680 (2011-2012 Catalog)

Prerequisite(s): 21 graduate credits in OR or SYST.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

OR 719 - Computational Models of Probabilistic Reasoning

Credits: 3 (NR)
Introduction to theory and methods for building computationally efficient software agents that reason, act, and learn environments characterized by noisy and uncertain information. Covers methods based on graphical probability and decision models. Studies approaches to representing knowledge about uncertain phenomena, and planning and acting under uncertainty. Topics include knowledge engineering, exact and approximate inference in graphical models, learning in graphical models,
temporal reasoning, planning, and decision-making. Practical model-building experience provided. Students apply what they learn to a semester-long project of their own choosing.

Equivalent to STAT 719/CSI 775

**Prerequisite(s):** STAT 652 or SYST/STAT 664, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**OR 735 - Advanced Stochastic Simulation**

Credits: 3 (NR)  
Special topics and recent developments in Monte Carlo simulation methodology for discrete-event stochastic systems. Contents vary; possible topics include statistical analysis of simulation output data, random number and random variate generation, variance reduction techniques, sensitivity analysis and optimization of simulation models, distributed and parallel simulation, object-oriented simulation, and specialized applications.

Equivalent to SYST 735

**Prerequisite(s):** OR 635 or permission of instructor.

**Notes:** May be repeated for credit when topics are distinctly different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**OR 741 - Advanced Linear Programming**

Credits: 3 (NR)  
Recent developments in linear programming. Highlights advances in interior point methods and also addresses developments in the simplex method. Projective methods, affine methods, and path-following methods are examined, including Karmarkar’s original work. Discusses relationships between these methods, and relationships to methods in nonlinear programming. Also discussed are advances in data structures and other implementation issues. Students test software and solve large-scale linear programs.

**Prerequisite(s):** OR 541 and 641.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**OR 750 - Advanced Topics in Operations Research**

Credits: 3 (RT)  
Special topics, applications, or recent developments in operations research. Contents vary and may include topics in optimization, stochastic methods, or decision support that are not covered in the standard OR curriculum.
Prerequisite(s): OR 541 or 542, and 600-level course that varies with content of course.

Notes: May be repeated for credit when topics are distinctly different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 751 - Advanced Topics in Operations Research for Planning and Scheduling

Credits: 3 (NR)
Introduces combinatorial optimization problems in scheduling and logistics. Solution techniques for various classes of such problems are developed. Topics include deterministic and stochastic scheduling algorithms with applications in manufacturing and service sectors.

Prerequisite(s): OR 541.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 763 - Research Methods in Systems Engineering and Information Technology

Credits: 3 (NR)
Examines alternative paradigms of scientific research and their applicability to research in information technology. Topics include fundamental elements of scientific investigation, basic principles of experimental design and statistical induction, philosophy of science and its relation to the information technology sciences, and case studies of information technology research.

Equivalent to IT 763/SYST 763

Prerequisite(s): STAT 554.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 774 - Advanced Dynamic Programming

Credits: 3 (NR)
Covers advanced topics on the theory and practice of dynamic programming, i.e., optimal sequential decision making over time in the presence of uncertainties. Stresses the mathematical foundations and introduces the theory, computational aspect, and applications of dynamic programming for deterministic and stochastic problems.

Prerequisite(s): OR674/SYST674 or permission of instructor.
OR 780 - Queuing Modeling of Computer-Communication Networks

Credits: 3 (NR)
Studies analytical modeling of computer and communication networks and performance evaluations. Topics include Markovian systems, open networks, closed networks, approximations, decomposition, simulation, sensitivity analysis, and optimal operation of systems. Presents local area networks, manufacturing systems, and other applications.

Equivalent to IT 780

Prerequisite(s): OR 645 or 647, or ECE 542; or equivalent.

OR 782 - Advanced Topics in Combinatorial Optimizations

Credits: 3 (RD)
Studies problems using most recent developments. Topics include cutting plane procedures based on polyhedral combinatorics; column-generation procedures for large, complex problems; heuristic approaches such as genetic algorithms, simulated annealing, and tabu search; study of special structures; reformulation techniques; and bounding approaches. Topics stress most recent developments in field.

Prerequisite(s): OR 641 and 642.

Notes: May be repeated for credit when topics are distinctly different.

OR 783 - Advanced Topics in Network Optimization

Credits: 3 (RD)
Recent developments in solving optimization problems on networks. Prepares doctoral students to perform advanced research on network-related problems. Topics include linear, discrete, nonlinear, and stochastic problems. Several aspects of problems also studied, including computational complexity, exact algorithms, heuristics, solvable special cases, and computer implementation issues.

Prerequisite(s): OR 643.
OR 784 - Advanced Topics in Nonlinear Programming

Credits: 3 (NR)
Studies theory and algorithms for solving nonlinear optimization problems. Contents vary; possible topics include large-scale and parallel-unconstrained optimization, theoretical issues in constrained optimization, duality theory, Lagrangian and sequential quadratic programming methods.

Prerequisite(s): OR 644.

Notes: May be repeated for credit when topics are distinctly different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 842 - Models of Probabilistic Reasoning

Credits: 3 (NR)
Survey of alternative views about how incomplete, inconclusive, and possibly unreliable evidence might be evaluated and combined. Discusses Bayesian, Baconian, Shafer-Dempster, and Fuzzy systems for probabilistic reasoning.

Equivalent to IT 842, SYST 842

Prerequisite(s): STAT 544 or OR 681, or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 888 - Distributed Estimation and Multisensor Tracking and Fusion

Credits: 3 (NR)
Centralized and distributed estimation theory, hierarchical estimation, tracking and data association, multisensor multtarget tracking and fusion, distributed tracking in distributed sensor networks, track-to-track association and fusion, and Bayesian networks for fusion.

Equivalent to SYST 888/ECE 753

Prerequisite(s): ECE 734 or SYST 611.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

OR 944 - The Process of Discovery and Its Enhancement in Engineering Applications

Credits: 3 (NR)
Studies ingredients of imaginative reasoning as it concerns efficient discovery of new ideas and valid evidential test of them. Topics include different interpretations of Peirce's theory of abductive reasoning and other forms of reasoning. Hintikka's
analysis of process of inquiry, and current attempts to design systems that provide assistance in discovery-related or investigative activities.

Equivalent to SYST 944

**Prerequisite(s):** OR 842 or SYST 842 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**OR 981 - Optimization in Medicine**

Credits: 3 (NR)

Course focuses on the application of optimization to medicine, as well as on modeling used and solution approaches to the optimization problems generated. Particular attention is paid to algorithms and methodology not discussed in other optimization courses. Topics covered include nonlinear integer programs, large-scale nonlinear and integer programs, problems governed by differential equations, and more.

**Prerequisite(s):** OR 641, OR 642, OR 643, or OR 644.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**Organization Development and Knowledge Management (ODKM)**

Offered by the School of Public Policy

**ODKM 700 - Organizations, Management and Work: Theory and Practice**

Credits: 3 (NR)

This introduction to organizations, management, and work examines ideas and practices from two perspectives: conventional ones that go back to the industrial age and scientific management; and contemporary ones that have to do with organizing knowledge-work. Covers contributions of a range of writers and deals with foundations of OD from the standpoint of both theory and practice.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**ODKM 705 - Group Dynamics and Team Learning**

Credits: 3 (NR)

Engaging in unstructured and semi-structured learning environment, students will learn how to facilitate team learning for organizational effectiveness. By exploring various aspects of group dynamics such as power, perception, motivation, leadership, and decision making, students will develop various competencies to manage teams and enhance their emotional and appreciative intelligence.
ODKM 710 - Social and Organizational Inquiry

Credits: 4 (NR)
Introduces participants to the ethics, conduct and evaluation of research into human, social and organizational realities. Explores relationships between what and how we measure and what we find. Students develop the capacity to reflect on themselves as research instruments, on their own impact on the systems under study, and on the impact of the research assumptions, framing and approach both on the results obtained and on the future development of those systems.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ODKM 715 - Creating Learning Organizations

Credits: 3 (NR)
Focuses on the epistemological and ontological implications of organizational life in the twenty-first century. Reevaluates traditional management approaches in light of global economies, instantaneous communication, changing technologies, and diverse workgroups in knowledge economies. Special attention to developing skills for "double- and triple-loop learning," and reflection in professional lives through learning conversations, journals, narrative, autobiography, and imaginative literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ODKM 720 - Collaborative Technologies for Knowledge Sharing

Credits: 3 (NR)
Examines the potential of collaborative technologies for creating effective knowledge sharing in organizations. Through the use of tools such as SharePoint, students will gain a comprehensive understanding of the state of the art of virtual work and collaboration technology and other subjects related to successful design of a collaborative knowledge work environment.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

ODKM 725 - Strategic Knowledge Management

Credits: 3 (NR)
An in-depth look at knowledge management, both theory and practices, which distinguishes between technology-oriented KM practices and people-oriented ones, with an emphasis on leveraging and sharing knowledge to get work done well and develop more effective organizations. Examines effective ways of organizing knowledge-work, including social networks, communities of practice, and the use of collaborative technologies.
**ODKM 730 - Special Topics**

Credits: 1-3 (NR)
Selected special topics in organization development and knowledge management not covered by existing ODKM courses.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ODKM 731 - Consulting Skills for Organizational Change**

Credits: 3 (NR)
Explores various theories and practices of change management, collaborative consulting, action research, and organization development. Using class projects and case studies, students bring together their understanding of organization development, their values, and their personal style to perform more effectively in various consulting roles. Students also learn various aspects of process consulting and client relationship management.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ODKM 735 - Organizational Development Practices**

Credits: 3 (NR)
Students develop applied knowledge of various organizational development practices such as action research and appreciative inquiry. Includes simulations to understand the complexities of real-world change management. Group projects with selected organizations will help students develop their diagnostic and analytical skills to become better facilitators of organizational learning.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**ODKM 740 - Learning Community**

Credits: 3 (NR)
Using workshops, seminars, simulations, and structured experiences, students will learn how to build a learning Community of Practice (CoP) as practitioners of organization development. They will also reflect upon the community building experience using research findings and design practice sessions to apply the lessons learned to the work environment.

Equivalent to MNPS 720

**Prerequisite(s):** Candidates for the M.S. in ODKM degree only.
Parks, Recreation, and Leisure Studies (PRLS)

Offered by the College of Education and Human Development

PRLS 110 - Exploring Outdoor Adventure

Credits: 2 (NR)
Provides students with an introduction to outdoor adventure activities and the leadership theory involved to properly plan the activities. This class aims to bridge the gap between theory and practice as it pertains to outdoor adventure activities. This class focuses on developing introductory skills in a variety of outdoor recreation activities, including rock climbing, canoeing, orienteering, and caving. Traditional classroom and in-the-field instruction will be used during the various activities.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 1

PRLS 115 - Introduction to Fly Fishing

Credits: 1 (NR)
A practical course designed for students with little or no knowledge of fly fishing. The course will involve activities to teach students the basics of fly fishing to include terms and equipment, casting, knot tying, aquatic entomology, fly selection, reading water, wading techniques and safety, and fly fishing tactics. In addition to the one-hour classes required during the week, a full day on a stream will be included.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PRLS 116 - Introduction to Indoor Rock Climbing

Credits: 1 (NR)
Introduces equipment, techniques, safety, and planning related to basic rock climbing.

Notes: Fee required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PRLS 117 - Rock Climbing

Credits: 2 (NR)
For individuals who have never done any formal rock climbing. Involves activities to teach students basic climbing terms,
techniques, equipment, and safety practices for top rope belay climbing and rappelling. Builds communication skills and trust.

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

### PRLS 118 - Intermediate Rock Climbing

**Credits:** 2 (NR)  
For individuals who have some prior skills in rock climbing looking to further increase their skill level. Involves teaching students climbing terms, advanced knots, equipment, safety practices for redirect belay and top rope belay, as well as setting up techniques using rope and webbing. Special emphasis on anchor building will also be included. Ability to climb and rappel at least at the beginner's level will be required. This is not a certification course.

**Prerequisite(s):** PRLS 117

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

### PRLS 119 - Trap and Skeet Shooting

**Credits:** 2 (NR)  
Designed to educate the student on gun and range safety. Includes hands-on learning of the games trap and skeet, where competitors fire at clay targets (approximately 4 ¼ inches in diameter and 1 ½ inches in height) launched from a trap at varying angles.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

### PRLS 120 - Introduction to Backpacking

**Credits:** 2 (NR)  
This practical and experiential course is designed for students with little or no knowledge of backpacking. Involves discussions, demonstrations, and activities to teach students the basics of backpacking. Topics covered include equipment selection and use, map and compass skills, backcountry cooking, staying healthy in the outdoors, safety and emergency procedures, backcountry ethics (Leave No Trace), and natural history. Application of these skills will be realized over a four-day backpacking trip. Not only will students have the opportunity to practice these skills, but they will also develop their leadership abilities by working in a collaborative team environment.

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0
PRLS 121 - Intermediate Trap and Skeet Shooting

Credits: 2 (NR)
Designed to increase the skill competencies in trap shooting. Includes hands-on learning of the different trap games (16-yard, handicap, doubles, and Olympic trap shoot on a wobble trap) where competitors fire at clay targets (approximately 4 ¼ inches in diameter and 1 ½ inches in height) launched from a trap at varying angles. Gun and range safety will also be emphasized.

Prerequisite(s): PRLS 119 or permission of instructor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PRLS 122 - Introduction to Horsemanship

Credits: 1 (NR)
Introduces the basics of horseback riding and horsemanship. Emphasis will be on learning how to care for a horse, tack a horse, and basic riding skills. Students will learn how to walk, trot, and jump small obstacles.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PRLS 123 - Intermediate Indoor Rock Climbing

Credits: 1 (NR)
Introduces the practices designed to move into the intermediate indoor climbing realm with a focus on efficient and creative body positions, including specific, more advanced techniques and strength training.

Prerequisite(s): PRLS 116 or permission of instructor

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PRLS 124 - Pistol Marksmanship

Credits: 1 (NR)
Introduces students to marksmanship skills in Olympic sport and target shooting. Increases students' knowledge of shooting safety, position shooting, equipment care and maintenance, and shooting sports competition methods and techniques.

Notes: Previous firearms experience is not required. Each student responsible for $120.00 range fee.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
PRLS 125 - Tracking, Trailing and Orienteering

Credits: 2 (NR)
Develops outdoor navigational and tracking skills and assumes no prior experience in tracking, trailing, or orienteering. Use of modern topographical maps and navigational compasses in a variety of settings.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

PRLS 170 - Introduction to White-water Kayaking

Credits: 2 (NR)
Designed to provide students an overview and entry-level skills and knowledge necessary to navigate rapids up to Class II difficulty and plan and execute trips on moving water. Includes instruction in, but not limited to, paddle strokes and maneuvers, boat handling, basic terminology, equipment, proper clothing, kayak design, trip planning, river safety, self and group rescue techniques, water reading, river etiquette, and environmental ethics. A high priority is placed on emphasizing safety aspects.

Notes: Fee required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PRLS 173 - Basic Coastal Kayaking

Credits: 2 (NR)
This course is designed to provide students with the core skills and knowledge necessary to safely paddle sea/coastal kayaks and execute trips on rivers and coastal environments. Includes instruction in, but not limited to, boat handling, terminology, kayak design, trip planning, marine hazards and safety, rules of the nautical road, weather and tides, and environmental ethics. There will be several trips within 50 miles of Mason.

Notes: Fee required.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PRLS 174 - Open Water Coastal Kayaking

Credits: 2 (NR)
This course is designed to provide experienced coastal kayaking students with an introduction to advanced strokes and maneuvers, open water rescues, on-water navigation, and safety concerns related to open water.

Prerequisite(s): PRLS 173 or permission of instructor
Notes: Fee required.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PRLS 175 - Introduction to Rowing

Credits: 1 (NR)
This course is designed to provide students with the skills and knowledge necessary to row successfully in an eight-oared rowing shell. Includes instruction in, but not limited to, proper handling of rowing equipment, basic terminology, the proper execution of the rowing stroke, water safety, and team building.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PRLS 180 - White-water Canoeing

Credits: 2 (NR)
A practical course designed for students with little or no knowledge or skills in moving water and white-water canoeing. Involve activities to teach basic terms, rules, techniques for river safety, paddle strokes, boat control and maneuvering, reading river currents and conditions, self rescue techniques, ethics and river etiquette, and running rivers up to Class II+ in difficulty. There will be one classroom and four all-day paddling sessions on regional rivers.

Prerequisite(s): Ability to swim fully clothed for five minutes and put on a PFD in water

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PRLS 181 - White-water Canoeing II

Credits: 2 (NR)
A practical methods course to advance and refine the student's white-water canoeing skills with regard to paddle strokes, turns, maneuvers, boat control, and safety rescue skills.

Prerequisite(s): PRLS 180 or permission of instructor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PRLS 190 - Downhill Skiing

Credits: 1 (NR)
Basic skills and techniques of downhill skiing are taught and refined. Includes becoming familiar with use of ski equipment, terminology, and safety rules. Includes lecture and field experience to improve downhill skiing skills.
PRLS 191 - Snowboarding

Credits: 1 (NR)
Basic skills and techniques of snowboarding are taught and refined. Includes becoming familiar with use of equipment, terminology, and safety rules. Includes lecture and field experience to improve snowboarding skills. This course also consists of demonstrations, discussions, and videos.

PRLS 195 - Introduction to Hot Air Ballooning

Credits: 2 (NR)
Includes history, FAA regulations, equipment, weather, instruments, flight planning, balloon operations, and medical factors. Laboratory includes skill development as a crewmember and pilot, using an AX-8 hot air balloon. FAA student pilot certificates will be offered to all students. Although this is an introductory course, those completing it with a grade of B or better will be eligible to sit for the FAA written examination for lighter-than-air, free balloon, a requirement for the private pilot certificate.

PRLS 200 - Wilderness First Responder

Credits: 2 (RD)
Examines the role of outdoor professionals in wilderness medicine and the response, care and rescue of outdoor participants in non-urban outdoor environments. Uses the Patient Assessment System (PAS) to assess backcountry patients in an intensive experiential course which addresses the issues of medico legal concerns, blood borne pathogens and infectious diseases.

PRLS 210 - Introduction to Recreation and Leisure

Credits: 3 (NR)
Traces the development of current concepts of recreation and leisure and their implications and consequences. Covers influences of philosophy, religion, science, economics, sociology, and politics on discretionary time and its uses.

Notes: Open to nonmajors.
PRLS 214 - Field Study in Natural History

Credits: 3 (RD)
Provides an introduction to natural history and its application in natural area interpretation through field study investigation of the environment. Covers fundamentals of bird, plant, animal, and rock identification, as well as sky and landscape interpretation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 220 - Experiential Education Theory and Application

Credits: 3 (NR)
Provides a broad theoretical, as well as practical, background in teaching and learning experientially. Concepts presented, experienced, and discussed include the basic premises of experiential learning according to a wide variety of educators and philosophers. The content and experience applies to recreation, education, development, and therapeutic settings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 221 - Challenge Course Facilitation

Credits: 3 (RD)
Provides the fundamental principles and techniques of challenge course facilitation. Classroom learning is combined with an experiential setting through leading youth groups in the field. Students are provided with an introduction to safety, skills, and facilitation techniques for low and high elements of outdoor challenge courses.

Prerequisite(s): CPR Certification and PRLS 220, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

PRLS 241 - Practicum

Credits: 3 (NR)
Paid or voluntary work experience in a park and recreation agency. Minimum period of 10 to 12 weeks of part-time employment or experience. Capstone course for minors, allowing for integration and application of course work, theories, and research to a work setting. Work sites chosen among four approved sites. Includes meetings and assignments prior to and during the practicum.

Prerequisite(s): 60 hours and PRLS 210.
Notes: Open to departmental majors and minors only. Serves as a capstone for minors who have completed PRLS 310, 316, and 327.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3  
**Grading:** Satisfactory/No Credit

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**PRLS 250 - Wilderness Travel and Sustainability**

Credits: 2 (NR)

This experiential course is designed for students with prior backpacking experience. Involves discussions, demonstrations, and activities that teach students wilderness skills, safety and judgment, leadership and teamwork, and environmental ethics. Topics covered include basic wilderness first-aid, hazard evaluation, emergency procedures, expedition behavior, self awareness, judgment and decision making, campsite selection, shelter and stove use, fire building, sanitation and hygiene, cooking, nutrition and rationing, equipment care and selection, staying warm and dry, route finding and navigation. Leave No Trace backpacking, weather, natural history, and wilderness ethics. Application of these skills will occur during the 14-day offtrail backpacking trip in a remote wilderness area. Not only will students practice these wilderness skills, but they will also develop leadership abilities by working in a collaborative team environment.  
Designated a Green Leaf Course.

**Prerequisite(s):** PRLS 120

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

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**PRLS 253 - Florida Everglades Canoe Expedition**

Credits: 3 (NR)

Focuses on developing the knowledge and skills necessary to plan, manage, and participate in extended wilderness excursions by canoe in remote locations, while exploring a region's natural history. Students will be engaged in classroom preparation; training in canoeing and wilderness travel/living skills; group leadership; and environmental education in the Everglades National Park ecosystem. The class will travel and camp for 6 days/night in the Everglades back country by canoe as a self-contained group. Students will perform a service project in the park. For students planning careers in outdoor recreation, interpretation, and natural resources management and planning; and students with a general interest in the course topics.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 1

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**PRLS 300 - People with Nature**

Credits: 3 (NR)

Traces philosophical evolution of perceptions of and attitudes toward nature. Examines role of philosophers, scientists, nature-
writers, and artists in the shaping of environmental thought. Includes extensive reading of Emerson, Thoreau, Muir, Leopold, Carson, Wilson, and others.
Designated a Green Leaf Course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 302 - Park Management and Operations**

Credits: 3 (NR)
Focuses on management and operations of park resources, including the management of visitors and recreation development. Emphasizes understanding of contemporary threats to park integrity and preservation of resources. Also covers maintenance management systems.

Prerequisite(s): PRLS 300

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 310 - Program Planning and Design**

Credits: 3 (NR)
Fundamental principles and techniques of the planning process for health, fitness, and recreation programs. Covers specifying an area of need; goals, objectives, and mission statement; generating solutions; and selecting a program design for implementation.

Prerequisite(s): HEAL 205, PHED 200, PRLS 210, SPMT 201 or TOUR 200. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 316 - Outdoor Education and Leadership**

Credits: 3 (NR)
Focuses on promotion of lifelong health and fitness via noncompetitive and informal outdoor activities. Introduces safety, skills, and leadership techniques. Covers sustainable use, conservation, and stewardship of natural resources.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 317 - Social Psychology of Play and Recreation**

Credits: 3 (NR)
Applies social psychological theories and research to the study of leisure, play, and recreation behavior, including correlates, antecedents, and consequences of and constraints to these concepts.
Prerequisite(s): Tour 200, PRLS 210, SPMT 201, or PHED 200.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 327 - Foundations of Therapeutic Recreation**

Credits: 3 (NR)
An introduction to the processes and techniques of therapeutic recreation to meet the unique needs of people with disabilities. This course examines the history, concepts, theories, and foundations of therapeutic recreation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 360 - Bill of Rights Issues in Parks, Schools, and Public Places**

Credits: 3 (NR)
Examines issues, particularly those involving First Amendment free speech and freedom of religion issues such as political protests, religious displays, and use permits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 362 - Cultural and Environmental Interpretation**

Credits: 3 (NR)
Focuses on communication processes and practices used to explain and interpret special characteristics of cultural and environmental resource sites for visitors. Conceptual principles for planning interpretive programs and multi-media delivery techniques are discussed. Methods for programming interpretive services, addressing multi-audience accessibility, and administration and evaluation of interpretive services used at recreation and tourism sites are also examined.

Prerequisite(s): PRLS 300, or PRLS 328, or TOUR 352 or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
When Offered: Spring

**PRLS 402 - Human Behavior in Natural Environments**

Credits: 3 (NR)

Applies social and behavioral theories to management for recreational users of land and water resources. Examines deterioration
and pollution of land and water, noise, crowding, and conflicts among users. Discusses strategies for mitigation of deleterious impacts and depreciative behaviors, and attitudes toward resource conservation, preservation, and use. Designated a Green Leaf Course.

**Prerequisite(s):** PRLS 210 and 300, or permission of instructor, and 60 credits

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PRLS 405 - Planning, Design, and Maintenance of Leisure Facilities**

Credits: 3 (NR)  
Covers quantity, location, and design standards for facilities. Includes safety, functionality, durability, and maintenance demand criteria in planning and design; programmatic and operational objectives to be met, including user comfort and convenience, crowd management, and traffic flow, and space relationships. Includes field study of local facilities.

**Prerequisite(s):** PRLS 310 or permission of instructor, and 60 credits

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PRLS 410 - Administration of RHT Organizations I**

Credits: 3 (NR)  
Focuses on operation and management of health, fitness, and recreation services organizations. Covers management and leadership theories and techniques, problem-solving and decision making, organizational communications, design of organizational structures, and budgeting.

**Prerequisite(s):** 60 hours or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PRLS 411 - Administration of RHT Organizations II**

Credits: 3 (NR)  
Focuses on planning techniques for health, fitness, and recreation organizations. Covers program and organizational marketing principles and strategies; service quality assessment and organizational evaluation techniques; and organizational financing.

**Prerequisite(s):** PRLS 410 and 60 hours.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PRLS 416 - Trends and Programming Assessment in Therapeutic Recreation**
Credits: 3 (NR)
Explores the role of leisure in human development with a specific focus on needs, demands, and services for people with disabilities and illness. Presents concepts associated with leisure, aging, physical challenge, targeting leisure services, research, and public policy.

Prerequisite(s): PRLS 327

Notes: Field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 417 - Processes, Techniques and Supervision in Therapeutic Recreation

Credits: 3 (NR)
Exploration of processes and techniques used in Therapeutic Recreation, with a focus on the nature and diversity of recreation and leisure activities, modalities and interventions, facilitation techniques and approaches, leadership roles and tasks, communication skills, clinical supervision, health and safety considerations, and the impact of the impairment and/or treatment on the individual.

Prerequisite(s): PRLS 327 and PRLS 416

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

PRLS 418 - Assessment in Therapeutic Recreation

Credits: 3 (NR)
Presents methods of assessment, development of treatment program plans, and evaluation of all components. Extends program design by developing competencies in the planning approaches, individual and group assessment techniques, program evaluation, and documentation strategies for people with disabilities and illness.

Prerequisite(s): PRLS 327 and 416

Notes: Field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 435 - Recreation Special Uses and Appeals

Credits: 3 (NR)
Management of extensive and varied commercial and noncommercial demands on federal lands. Policies and procedures used by federal land managers. Implementation, effects, and problems of permit systems; appeal provisions.
PRLS 442 - Foundations of Public Domain Management

Credits: 1 (NR)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 443 - Special Uses Management on Federal Lands

Credits: 4 (NR)
Special use authority and authorizations. Policies, regulations, and directives in processing applications. Coordination and administration of special uses and integration with land and resource management plans. Includes agriculture, industry, community, aviation, water, treasure trove, and cultural uses.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

PRLS 444 - Linear Uses and FERC Licenses on Federal Lands

Credits: 3 (NR)
Legislation, regulation policies, and directives governing linear uses. FERC licensing of hydroelectric power generation and distribution. Right-of-way for oil, gas, and electric transmission, railroads, communication, trams, conveyors, roads, and trails. FERC consultation, exemption, and licensing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 445 - Valuation and Landownership Adjustment

Credits: 5 (NR)
Landownership authority, coordination, and adjustment processes; land valuation and rules, and processes of appraisal, title exchange, purchase, donation, transfer, sale, and condemnation of properties.

Hours of Lecture or Seminar per week: 5
Hours of Lab or Studio per week: 0
PRLS 446 - Right-of-Way Acquisition

Credits: 3 (NR)
Authorities and procedures right-of-way acquisition from public agencies and private landowners. Planning, coordination, and project scheduling requirements. Steps in the acquisition process. Cooperative development and use of roads.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 447 - Land Status, Boundaries, Claims, and Withdrawals

Credits: 3 (NR)
Land survey and status records system, programs for maintaining and managing boundaries, handling claims and encroachments, the land status record system, and Bureau of Land Management master title plot system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 448 - American Indian Rights and Claims

Credits: 3 (NR)
American Indian sovereignty, Alaska Native corporations, colonization; treaties, rights, and claims; cultural resources an Indian laws and consultation with tribal governments.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 450 - Research Methods

Credits: 3 (NR)
Covers the development of empirical research designs for both practical and theoretical problems in health, fitness, and recreation resources management. Includes literature review of hypothesized relationships, and formulation of research proposals.

Fulfills writing intensive requirement in the major.

Prerequisite(s): 60 credits and one of the following: STAT 250, DESC 210 OM 210, SOC 313, OM 250, or IT 250. Prerequisite enforced by registration system.

Notes: Only STAT 250 meets the Mason Quantitative Reasoning General Education requirement.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 460 - Sport and Recreation Law
Credits: 3 (NR)
Emphasizes safety, liability, and risk. Covers current law and liability issues for administrators of RHT facilities and programs.

Prerequisite(s): 60 credits

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 480 - Special Topics in Parks, Recreation, and Leisure Studies

Credits: 1-3 (NR)
Selected topics reflecting interest in specialized areas of parks and outdoor recreation or therapeutic recreation.

Prerequisite(s): 60 credits

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 490 - Internship

Credits: 12-15 (NR)
Paid or voluntary work experience in a park and recreation agency for a minimum period of 10-12 weeks of full-time employment, and 480 hours for therapeutic recreation students. Applies course work, theories, and research to work settings. Work sites are chosen by students after approval of faculty supervisors. Includes meetings and assignments before and during internship.

Prerequisite(s): 90 credits; HEAL 205 and 323; PHED 200; and PRLS 210, 310, 316, and 410

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 12
Grading: Satisfactory/No credit only

PRLS 499 - Independent Study

Credits: 1-3 (NR)
Individual study of topic area in leisure research, theory, or practice under direction of faculty.

Prerequisite(s): 90 credits

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

PRLS 501 - Introduction to Natural Resources Law
Selected legal issues involving conflicting use and preservation demands on our nation's limited natural resource base, particularly those involving public lands, open space, and recreation resources. Uses case studies of recent court decisions. Designated a Green Leaf Course.

**Prerequisite(s):** PRLS 460 and 90 credits, graduate status, or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PRLS 503 - Administration and Disability Rights in Therapeutic Recreation**

Credits: 3 (NR)  
Overview of major law and policy issues related to therapeutic recreation services for people with disabilities. Primary focus is on the Americans with Disabilities Act and related federal legislation.

**Prerequisite(s):** PRLS 460 and 90 credits, or graduate status; or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PRLS 526 - Environmental Education and Resource Interpretation**

Credits: 3 (NR)  
Provides methods for communicating and disseminating information pertaining to the use of natural recreation resources. Covers design and implementation of educational materials and programs to enhance understanding and appreciation of cultural, historical, and natural resources.

**Prerequisite(s):** PRLS 402 or permission of instructor, and 90 credits

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PRLS 531 - Natural Resources Recreation Planning**

Credits: 3 (NR)  
Origins and evolution of recreation use philosophy, policies, and service of public estate management. Examines planning for a spectrum of opportunities, from wilderness to developed sites, with attention to financial consideration and sustainable use of cultural and visual resources. Designated a Green Leaf Course.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
PRLS 533 - Visitor Services

Credits: 3 (NR)
Examines motivation of resource-based recreation participants. Covers visitors' expectations and perceptions, with emphasis on implication for service quality, staff training, and other management responsibilities. Discusses use and user conflicts and placement, information and interpretive service, and human and other interpretive service resources.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 535 - Evaluating Recreation Outcomes

Credits: 3 (NR)
Covers application of quantitative and qualitative research methods to the evaluation of programs provided to visitors and users of public lands for outdoor recreation. Focuses on needs assessment and application of meaningful measures for formative and summative evaluations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 542 - Foundations of Public Domain Management

Credits: 1 (NR)

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PRLS 560 - Liability and Risk Management

Credits: 3 (NR)
Examines liability and risk; federal jurisdiction, legal apparatus, and decision-making; and analysis of resource-based recreation case law.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 598 - Special Topics
Projects related to parks, recreation, and leisure studies.

Prerequisite(s): 90 credits

Notes: May be repeated for a total of 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**PRLS 599 - Independent Study**

Credits: 1-3 (RD)
Study of a problem area in parks, recreation, and leisure studies research; theory or practice under the direction of faculty member.

Prerequisite(s): 90 credits

Notes: May be repeated. No more than 3 credits may be earned.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

**PRLS 601 - History of Leisure and Sport in American Society**

Credits: 3 (NR)
Examines leisure and sport in American society from the early colonial period to the present day. Investigates the pattern of leisure and sport as America moved from a largely agrarian to a highly industrialized nation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 610 - Recreation Administration and Planning**

Credits: 3 (NR)
Examines recreational administration concepts regarding organizational structure and operations, personnel management, financing, policy development, and public relations procedures.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PRLS 611 - Social Psychology of Leisure**
Credits: 3 (NR)
Addresses historical, theoretical, and empirical foundations of social psychological constructs relative to social behavior in park, recreation, sport, and tourism settings. Focuses on attitudinal, social, and motivational theories as applied to leisure-related contexts.

Prerequisite(s): Graduate student status

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 612 - Philosophy of Leisure and Sport

Credits: 3 (NR)
Investigates the phenomenon of leisure and sport from a philosophical perspective. Utilizes the philosophical approach to better explain the role that leisure and sport play in American society.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 614 - Legal Issues in Recreation Administration

Credits: 3 (NR)
Surveys current legal issues relevant to Recreation Administration, including, but not limited to, tort law, civil rights law, employment law, constitutional law, and copyright law. This course uses case studies of recent court decisions.

Prerequisite(s): Graduate status or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 635 - Recreation Special Uses and Appeals

Credits: 3 (NR)
Management of extensive and varied commercial and noncommercial demands on federal lands. Policies and procedures used by federal land managers. Implementation, effects, and problems of permit systems; appeal provisions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 643 - Special Uses Management on Public Lands

Credits: 4 (NR)
Special use authority and authorizations. Policies, regulations, and directives in processing applications. Coordination and administration of special uses and integration with land and resource management plans. Includes agriculture, industry,
community, aviation, water, treasure trove, and cultural uses.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

PRLS 644 - Linear Uses and FERC Licenses on Federal Lands

Credits: 3 (NR)
Legislation, regulation policies, and directives governing linear uses. FERC licensing of hydroelectric power generation and distribution. Right-of-way for oil, gas, and electric transmission, railroads, communication, trams, conveyors, roads, and trails. FERC consultation, exemption, and licensing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 645 - Valuation and Landownership Adjustment

Credits: 5 (NR)
Landownership authority, coordination, and adjustment processes; land valuation and rules, and processes of appraisal, title exchange, purchase, donation, transfer, sale, and condemnation of properties.

Hours of Lecture or Seminar per week: 5
Hours of Lab or Studio per week: 0

PRLS 646 - Right-of-Way Acquisition

Credits: 3 (NR)
Authorities and procedures right-of-way acquisition from public agencies and private landowners. Planning, coordination, and project scheduling requirements. Steps in the acquisition process. Cooperative development and use of roads.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 647 - Land Status, Boundaries, Claims, and Withdrawals

Credits: 3 (NR)
Land survey and status records system, programs for maintaining and managing boundaries, handling claims and encroachments, the land status record system, and Bureau of Land Management master title plot system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PRLS 648 - American Indian Rights and Claims

Credits: 3 (NR)
American Indian sovereignty, Alaska Native corporations, colonization; treaties, rights, and claims; cultural resources an Indian laws and consultation with tribal governments.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PRLS 670 - Environmental Law

Credits: 3 (NR)
Focuses on interpretation of environmental laws and regulatory issues. Emphasizes critical evaluation of alternatives to unresolved issues in environmental policies involving endangered species, hazardous waste, and toxic substances.

Prerequisite(s): Graduate status and courses in ecology and environmental biology, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Persian (PERS)

PERS 110 - Elementary Persian

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

PERS 210 - Intermediate Persian

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Persian-speaking regions.

Prerequisite(s): PERS 110, appropriate placement score, or permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Philosophy (PHIL)

Offered by the College of Humanities and Social Sciences

PHIL 100 - Introduction to Philosophy

Credits: 3 (NR)
Introduction to the nature of philosophical reasoning and some of the main problems of philosophy.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 112 - Ethics and the Cybersociety

Credits: 1 (NR)
Examines ethical issues associated with new developments in information technology, including privacy rights, intellectual property rights, and the effect of information technology on society.

Fulfills general education requirement in information technology (ethics only).

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHIL 151 - Introduction to Ethics

Credits: 3 (NR)
Considers some perennial issues in ethical theory.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 156 - What Is Art?

Credits: 3 (NR)
Introduction to philosophical reflection on the arts by looking at the critical issues in the history of aesthetics. Applies considerations to specific works and exploring these works in terms of their historical contexts and influences. Concentrates on one form of art or one period and always emphasizes questions of critical evaluation and art historical analysis.

Fulfills general education requirement in arts.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PHIL 173 - Logic and Critical Thinking
Credits: 3 (NR)
Basic concepts and techniques of deduction, emphasizing the modern treatment of such topics as quantification and rules of inference, with study of the classical treatment. Basic principles of induction, informal fallacies, and uses of logic in everyday life.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 243 - Global Environmental Ethics
Credits: 3 (NR)
Examines the global dimensions of environmental problems. Although environmental problems are global in reach, because different societies make different philosophical and ethical assumptions, they are understood in different ways. Examines several environmental problems, including climate change, population growth, and resource depletion, from a variety of scientific, policy, and cross-cultural perspectives.

Fulfills general education requirement in global understanding.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 253 - Philosophy and Literature
Credits: 3 (NR)
Examines differences and relations between literary and philosophical texts. Examines texts from a given period in the history of literature and philosophy. Topics include the presence of common issues in literary and philosophical writings, the influence of philosophical ideas on the production of literary texts and literary theory, and the development in literary texts of issues that are possible objects of philosophical inquiry.

Fulfills general education requirement in literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 301 - History of Western Philosophy: Ancient
Credits: 3 (NR)
Classical Greek philosophy, including pre-Socratics, Socrates, Plato, and Aristotle.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PHIL 302 - History of Western Philosophy: Medieval

Credits: 3 (NR)
Figures and problems of medieval philosophy. Study of leading thinkers from the 5th to the 15th centuries.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 303 - History of Western Philosophy: Modern

Credits: 3 (NR)
Figures and problems of modern philosophy. Study of philosophers such as Descartes, Locke, Berkeley, Hume, Kant, and Hegel.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 305 - Business Ethics

Credits: 3 (NR)
Examines some moral problems that arise with regard to the responsibilities of various segments of the business community, including employers, management, stockholders; to one another; to the consumer; and to society at large.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 306 - Philosophy Internship

Credits: 3 (NR)
Gives students the opportunity to apply philosophical skills in real-world settings. Internships arranged and supervised by faculty in the Department of Philosophy.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 309 - Bioethics

Credits: 3 (NR)
Examines some major moral issues involved in practice and research in medicine and health care. Topics to be chosen from medical experimentation, definition of death, physician-assisted dying, genetics and human reproduction, distribution of scarce resources, fertility, and organ transplants.

Fulfills general education requirement in synthesis.
Prerequisite(s): Completion or concurrent enrollment in all other general education courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 311 - Philosophy of Law

Credits: 3 (NR)
Investigation of theories of natural law, legal positivism, and legal realism as they pertain to some of the central philosophical questions about law.

Prerequisite(s): 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 312 - Philosophy of Technology

Credits: 3 (NR)
Philosophical examination of modern technology in its broadest human context. Several alternative philosophies of technology are considered. Examines the relationships between technology and religion, economics, and politics. Ethical issues raised by the use of technology are also examined. Typically, the course focuses on the ethical issues raised by the use of one kind of technology.

Prerequisite(s): 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 313 - Philosophy of Religion

Credits: 3 (NR)
Study of classical appeals to philosophy in support of belief in god's existence (Philo, Augustine, Anselm, Aquinas, Descartes); the fideism of Hume and the metaphysical agnosticism of Kant; the concept of religious experience in the philosophies of Hegel, Schleiermacher, and Kierkegaard; and the problem of religious language in contemporary empirical philosophy.

Prerequisite(s): 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 323 - Classical Western Political Theory
Exploration through lecture and discussion of developments in the Western tradition of political thought from the time of the Greek city-state to late medieval Christendom, focusing on such topics as the nature and purpose of politics, the relationship between the individual and the state, the political significance of religion and tradition, and the concept of natural law.

**Prerequisite(s):** GOVT 101, or 3 credits of philosophy.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PHIL 324 - Modern Western Political Theory**

Credits: 3 (NR)
Exploration through lecture and discussion of developments in the Western tradition of political thought from the Renaissance to the middle of the 19th century, focusing on such topics as the rise of individualism in political theory, early developments in social contact theory, theories of radical popular sovereignty, and early criticisms of liberal theory.

Equivalent to GOVT 324

**Prerequisite(s):** GOVT 101, or 3 credits of philosophy.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PHIL 325 - Karl Marx's Social and Political Thought**

Credits: 3 (NR)
Study and evaluation of Marx's social and political ideas based on writings selected from several phases of his career. Examination of relation of Marx's thought to post-Marxian socialist theory and practice.

**Prerequisite(s):** 3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PHIL 327 - Contemporary Western Political Theory**

Credits: 3 (RT)
Exploration through lecture and discussion of recent developments in the Western tradition of political thought from the middle of the 19th century to today. Different sections focus on one or another of the various political theories that have been influential during this period such as liberal, libertarian, conservative, communitarian, Marxist, feminist, and postmodern thought.

Equivalent to GOVT 327

**Prerequisite(s):** GOVT 101, or 3 credits of philosophy.

**Notes:** May be repeated for a maximum of 12 credits when topic is different.
PHIL 332 - Twentieth-Century Analytic Philosophy

Credits: 3 (NR)
Examination of the attempts of 20th-century philosophers to solve philosophical problems by an analysis of language. Figures and movements covered include Russell, Moore, Wittgenstein, logical positivism, and ordinary language philosophy.

Prerequisite(s): 3 credits of logic and PHIL 303, or permission of instructor.

PHIL 333 - American Philosophy: Pragmatism

Credits: 3 (NR)
Examines the philosophical movement of American Pragmatism, with emphasis on its origin in the late nineteenth century. Figures covered include Peirce, James, Dewey, and Mead.

Prerequisite(s): 3 credits of philosophy, or permission of the instructor.

PHIL 335 - Nineteenth-Century Philosophy

Credits: 3 (NR)
Development of German Romanticism and Idealism during a brilliant period in the history of the West rivaled only by ancient Greece. Kant, Fichte, Hegel, Kierkegaard, Schopenhauer, and Nietzsche mount a revolt against the rationalism and scientism of the modern world.

Prerequisite(s): 3 credits of philosophy, or permission of instructor.

PHIL 336 - Twentieth-Century Continental Thought: Existentialism

Credits: 3 (NR)
Examination of existential philosophy from its 19th-century origins to its 20th-century expressions. Philosophers studied include Kierkegaard, Nietzsche, Sartre, De Beauvoir, and Buber.
Prerequisite(s): 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 337 - Twentieth-Century Continental Thought: Phenomenology

Credits: 3 (NR)
Examines phenomenological way of doing philosophy, its findings in regard to the "life-world," questions of "first philosophy," and the subject matter of the social sciences, as well as critical difficulties in its development. Texts by Husserl, Heidegger, Merleau-Ponty, Sartre, Schutz, and Derrida.

Prerequisite(s): 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 338 - Woman: The Philosophical Questions

Credits: 3 (NR)
Exploration of the meaning and politics of the question of woman that puts the idea of woman into question. Recognizing the historical context of this issue, the ways in which the structures of patriarchy situate woman as the other and determine the meanings of sexuality, subjectivity, the body, and language are examined. One overriding theme is relationship between the "woman" question and other central issues of contemporary philosophy.

Prerequisite(s): 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 340 - Hermeneutic Philosophy

Credits: 3 (NR)
Study of the development of hermeneutic philosophy in works by Heidegger, Gadamer, and Ricoeur, as an effort toward coming to terms with the historicity of human experience. Implications for interpretive understanding of artworks, institutions, events, texts, and the human condition.

Prerequisite(s): 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 343 - Topics in Environmental Philosophy
Credits: 3 (NR)

An in-depth examination of selected environmental issues from a philosophical perspective. Such issues might include the value of nature, the moral status of animals, duties to protect wilderness areas, economics and environmental protection, environmental justice, and environmental aesthetics. Designated a Green Leaf Course.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 349 - Christian Ethics

Credits: 3 (NR)
Examines the foundations of Christian and Jewish ethics from the Hebrew Bible and studies the meaning of Christian teachings. Examines Catholic, Orthodox, and Protestant texts as the framework to explore various Christian positions on major ethical issues such as war, embryonic stem cell research, abortion, and euthanasia in order to understand the meaning of the Christian life as it is faithfully practiced by members of the major Christian groups.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 354 - Topics in Modern Jewish Thought

Credits: 3 (NR)
Surveys modern Jewish thought, engaging some of the most important themes of this period including Jewish responses to rationalism, romanticism, idealism, existentialism, and legalism. Studies work from Baruch Spinoza to Emanuel Levinas.

Equivalent to RELI 354

Prerequisite(s): 3 credits in religious studies or philosophy or permission of instructor.

Notes: Students may not receive credit for both PHIL 354 and RELI 354

Hours of Lecture or Seminar per week: 2.5
Hours of Lab or Studio per week: 0

PHIL 355 - Theories of Ethics

Credits: 3 (RD)
A critical examination of a variety of different types of classical, modern, and contemporary ethical theories, including consequentialist theories, deontological theories, and virtue theories.
**PHIL 356 - Philosophy of Art**

Credits: 3 (NR)
Basic problems that arise from an inquiry into meaning and value of art and our response to art.

**Prerequisite(s):** 3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHIL 357 - Philosophy of the Social Sciences**

Credits: 3 (NR)
Philosophical issues relating to competing methodologies for the social sciences. Analysis and critique of mainstream positivism and behaviorism; paradigm theory and scientific revolutions; interpretive understanding and hermeneutical science; phenomenology and the social construction of reality; ethnomethodology and situational meaning; analytic philosophy and action theory; the "idea" of a social science; sociology of knowledge and theory of ideology; and Western Marxism and critical theory.

Equivalent to SOCI 599

**Prerequisite(s):** 3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHIL 371 - Philosophy of Natural Sciences**

Credits: 3 (NR)
One semester of logic recommended. Study of aims and methodology of science. Among the questions of concern are: What constitutes a good scientific explanation? What grounds are used for comparing rival theories? Is there a special method of scientific discovery?

**Prerequisite(s):** 3 credits of philosophy, or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHIL 373 - Theory of Knowledge**
Discussion of basic problems concerning the nature of knowledge, with study of the relation of knowledge to perception, belief, and language.

**Prerequisite(s):** 3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHIL 374 - Philosophy of Mind**

Credits: 3 (NR)  
Investigation of such theories as dualism, behaviorism, and materialism as they pertain to some of the central philosophical questions about mind.

**Prerequisite(s):** 3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHIL 375 - Metaphysics**

Credits: 3 (NR)  
Study of basic problems concerning being in general and foundations of individual being; traditional treatments of such problems and criticism of possibility of such knowledge. Selected readings from Plato, Aristotle, Aquinas, Spinoza, Leibniz, Kant, Bradley, Heidegger, and others.

**Prerequisite(s):** 3 credits of philosophy, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHIL 376 - Symbolic Logic**

Credits: 3 (NR)  
Study of predicate calculi by means of a step-by-step construction of artificial languages. Topics include procedures for constructing a calculus, proof techniques, significant properties of predicate calculi, and procedures for recognizing phrases.

**Prerequisite(s):** PHIL 173 or MATH 110, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHIL 377 - Darwin: Biology and Beyond**
Introduction to and philosophical examination of the theory of evolution in its historical perspective. Examines Darwin’s theory of evolution as a scientific theory, connect it to its context in the history of science, and survey its wider cultural impact. In particular, examine implications of the theory of evolution for religion and morality.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHIL 378 - Reason, Science and Faith in the Modern Age**

Credits: 3 (NR)
Historical examination of the rise of sciences in the modern age (1500-present) and the impact this has had on religion, drawing from such thinkers as Luther, Bacon, Galileo, Newton, Pascal, Hume, Darwin, Kierkegaard, and James.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHIL 379 - Perspectives on Time**

Credits: 3 (NR)
Examines the variety of ways time is conceptualized in different disciplines. Influential conceptions of time from the history of philosophy are studied in order to provide a comparative framework within which to consider specialist conceptions of time drawn from the sciences and humanities, including relativistic time, geological deep time, life cycles, and time in historical narrative.

Fulfills general education requirement in synthesis.

Prerequisite(s): 3 credits of philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring.

**PHIL 391 - Special Topics in Philosophy**

Credits: 3 (RT)
Examines topics of current interest such as death and dying, rights of children, and philosophical controversies in modern physics.
Notes: May be repeated for a maximum of 12 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 421 - Seminar

Credits: 3 (RD)
Explores topics in current philosophical research in a seminar format. Topics vary.

Prerequisite(s): 9 credits in philosophy. Students with fewer credits in philosophy may be admitted, at the discretion of the professor, if the topic is sufficiently close to their field of study.

Notes: May be repeated for a maximum of 18 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 422 - Honors Seminar

Credits: 3 (RT)
Seminar for students enrolled in the honors program in philosophy.

Prerequisite(s): 9 credits in philosophy and acceptance to the honors program in philosophy.

Notes: May be repeated for a maximum of 18 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 425 - Independent Study

Credits: 1-3 (RT)
Independent study under supervision of faculty member. Students and faculty agree on program of study to include at least a reading list and final written project. Students must arrange for independent study in the semester before they wish to enroll. Requires approval of department.

Prerequisite(s): 60 credits, including 15 credits in philosophy and permission of department.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

PHIL 427 - Feminist Political Thought
Credits: 3 (NR)
Explores feminist political thought in historical context. Topics include feminist political movements, feminist critiques of
political philosophy, and feminist contributions to political theory.

Prerequisite(s): GOVT 101 or WMST 200, or 3 credits of philosophy; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 470 - Seminar: Philosophical Examination of Social Issues and the Law

Credits: 3 (NR)
Philosophical study of social issues that are subject to legislation and judicial review. Analysis of the purpose and function of law
in society lays the groundwork for reflection on specific issues such as abortion, euthanasia, capital punishment, divorce, child
care, and health care.

Prerequisite(s): 3 credits in philosophy, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 471 - Honors Seminar

Credits: 3 (RT)
Honors version of PHIL 470.

Prerequisite(s): 9 credits in philosophy and acceptance to the honors program in philosophy.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 510 - Seminar in Ethics of Health Care

Credits: 3 (NR)
Examination of moral dilemmas within the health care profession on ethical theories and principles. Special emphasis on patients' 
rights, social justice of health care, and evolving health care technologies.

Prerequisite(s): 90 credits, graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 602 - Plato: Selected Dialogues
Credits: 3 (RD)
Study of the central issues in the philosophy of Plato through a close reading of selected dialogues. Issues investigated include the questions of the possibility of knowledge, the nature of being, and of the good.

Prerequisite(s): Graduate standing.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 603 - Aristotle: Selected Works

Credits: 3 (RD)
Close study of Aristotle's work and its place and future in history of philosophy. Topics vary by semester and include Aristotle's metaphysics, natural sciences, ethics, political thought, logic, epistemology, and psychology.

Prerequisite(s): Graduate standing.

Notes: May be repeated for a maximum of 6 credits when topic is significantly different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 604 - Augustine and Aquinas

Credits: 3 (NR)
Critical examination of philosophies of Augustine and Aquinas with special attention to the mode of argument of each.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 605 - Mind-Body Problem in Early Modern Philosophy

Credits: 3 (NR)
Examines views of major early modern philosophers on issues such as mind and body interaction, personal identity, and freedom of the will, as well as of interpretations of these philosophers by historians of philosophy.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PHIL 608 - Hegel's Phenomenology of the Spirit

Credits: 3 (NR)
A study of the philosophy of Hegel through a reading of the text that presents an introduction to his system. Special attention is paid to Hegel's background in the work of Kant and the German Idealists.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 611 - Philosophy of Law

Credits: 3 (NR)
Examines major jurisprudential theories that underpin law in Western society. After examining the theories, students apply them to contemporary social and political problems.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 615 - Postmodernist Thought

Credits: 3 (NR)
In recent decades, the term "postmodern," first used by art critics in the late 19th century, has been taken up by prominent contributors to the arts, social thinkers, and philosophers, to describe developments as well as the current period. Examines three thematic concerns found in work that is identified with postmodern issues: what modernity defines itself in contrast to or against, the status of "man," and status of "subjectivity."

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 616 - Phenomenology

Credits: 3 (NR)
This major approach in philosophy is studied in regard to its basic features, the tasks to which it has been set by major contributors, certain findings of phenomenology in practice, as well as crucial problems that develop as phenomenology proceeds and how they are addressed by phenomenologists.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PHIL 617 - Movements and Issues in the History of Political Philosophy

Credits: 3 (RD)
Explores themes, movements, and periods in the history of political theory.

Prerequisite(s): Graduate standing.

Notes: May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 618 - Contemporary French Feminism

Credits: 3 (NR)
Examines philosophical contexts of existential-phenomenological and psychoanalytic French Feminist. It explores the ways in which French feminist thought has influenced continental philosophical thinking and international feminist theory.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 621 - Philosophy of Science

Credits: 3 (NR)
Explores whether and how scientific advances can be achieved. Special attention is paid to relativism and rationalism debates and to the role of technology in science.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 631 - Freud and Philosophy

Credits: 3 (NR)
Explores philosophical aspects of Freud's thought, focusing on Freud's philosophy of human nature and culture, and influence on contemporary thought.

Prerequisite(s): 6 credits of philosophy, course in personality theory, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PHIL 632 - Twentieth-Century Logical Positivism

Credits: 3 (NR)
Examines 20th century logical positivism and its place in the history of philosophy. Topics include Russell's logical atomism and theory of descriptions, program of the Vienna Circle, attempts to formulate empiricist criteria of meaning, and legacy left by the movement.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 640 - History of Ethical Theory

Credits: 3 (NR)
Examines history of Western ethical theory from ancient Greece to the present day, including virtue theory, consequentialism, deontological theory and contemporary feminism.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 642 - Biomedical Ethics

Credits: 3 (NR)
Explores the application of ethical theories and principles to issues in contemporary health care. Cases central to the development of the field will be examined.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 643 - Environmental Ethics

Credits: 3 (NR)
An examination of human interactions with the natural environment from an ethical perspective. Emphasis will be placed on the strengths and weaknesses of various ethical theories and the different conceptions of the proper relationship between humans and their environment.

Prerequisite(s): Graduate standing.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 644 - Business and Organizational Ethics

Credits: 3 (NR)
Examines organizational culture as necessary for ethical development and of the application of ethics in business and organizational settings.

Prerequisite(s): Graduate standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 645 - Research Ethics

Credits: 3 (NR)
Ethical theories, concepts, and principles, and how these shape research guidelines. Students learn to identify ethical issues in research, to reflect on them critically, and to respond effectively. Designed for students in the humanities, social sciences, life sciences, and health sciences.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 646 - International Ethics

Credits: 3 (NR)
Considers normative issues in international affairs, including global distributive justice, just war, foundations of human rights, harms to women, cultural and national identities, possibilities for transnational democracy, responsibilities of global corporations, and environmental ethics.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHIL 658 - Feminist Theory

Credits: 3 (NR)
Analysis of the critique of patriarchy offered by contemporary continental feminist philosophers. Examines contemporary moral, political, and epistemological issues in feminist theory.

Prerequisite(s): Admission to graduate program or permission of instructor.
PHIL 673 - Current Issues in Theory of Knowledge

Credits: 3 (NR)
Advanced exploration of conditions and limits of knowledge, from the perspective of contemporary philosophy. Is there any infallible, or fallible but at least reasonable, foundation for achieving an understanding of the world and of our minds? This question is examined from the perspective of sense datum theory, coherentism, and various naturalized epistemologies. The nature of a priori knowledge (from mathematics and logic) is also examined.

Prerequisite(s): Admission to graduate program or permission of instructor.

PHIL 681 - Ancient Philosophical Figures

Credits: 3 (RT)
Examines major philosophical authors of crucial philosophical texts and their influence on philosophical thought.

Prerequisite(s): Graduate standing.

Notes: May be repeated for a maximum 6 credits when topic is different.

PHIL 682 - Early Modern Philosophical Figures

Credits: 3 (RT)
Examines major philosophical authors of the early modern period and their influence on philosophical thought.

Notes: May be repeated for a maximum of 6 credits when topic is different.

PHIL 683 - Contemporary Philosophical Figures

Credits: 3 (RT)
Examines major recent philosophical authors and their influence on philosophical thought.

Notes: May be repeated for a maximum of 6 credits when topic is different.
PHIL 691 - Special Topics in Ancient Philosophy

Credits: 3 (RT)
Examines topics of current interest in ancient philosophy.

Prerequisite(s): Graduate standing, or permission of instructor.

Notes: May be repeated for a maximum of 6 credits when topic is different.

PHIL 692 - Special Topics in Early Modern Philosophy

Credits: 3 (RT)
Topics vary.

Notes: May be repeated for a maximum of 6 credits when topic is different.

PHIL 693 - Directed Readings in Philosophy

Credits: 3 (RT)
Directed readings and research on specific topic in philosophy chosen by student and instructor.

Prerequisite(s): Graduate standing or permission of instructor.

Notes: May be repeated for a maximum of 6 credits.

PHIL 694 - Special Topics in Contemporary Philosophy

Credits: 3 (RT)
Topics vary.

Notes: May be repeated for a maximum of 6 credits when topic is different.
PHIL 719 - Phenomenology of World

Credits: 3 (NR)
Studies one of the most fully deployed and enduring themes in phenomenological philosophy, namely, sense of "world." Philosophers covered include Husserl, Heidegger, and Merleau-Ponty.

Prerequisite(s): Previous course in phenomenology, or permission of instructor.

PHIL 720 - Nietzsche and his Readers

Credits: 3 (NR)
Reading of major texts of Nietzsche and some of his most influential interpreters and critics.

Prerequisite(s): Graduate standing.

PHIL 721 - Advanced Seminar in Philosophy

Credits: 3 (RT)
Close study of selected topics in current philosophical discourse.

Prerequisite(s): Graduate standing.

Notes: May be repeated for credit when topic is different.

PHIL 733 - Current Issues in Cognitive Science

Credits: 3 (RD)
Examines current areas of investigation in cognitive science and philosophy of mind such as nature of consciousness, and representational and connectionist theories of mind.

Prerequisite(s): Admission to master's program in philosophy or permission of instructor.
PHIL 799 - Thesis

Credits: 1-6 (RD)
Develop research and write an original thesis under the direction of their thesis director.

Prerequisite(s): Completion of 24 credits, approval of the thesis proposal, and permission of instructor (thesis director).

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

Physical Education (PHED)

Offered by the College of Education and Human Development

PHED 102 - Introduction to Soccer

Credits: 1 (NR)
This course is designed to introduce individuals to the basic elements of soccer. This includes dribbling, kicking, passing, trapping, tactics, and strategy.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 103 - Fencing I

Credits: 1 (NR)
Gives the beginning student basic knowledge of the sport of fencing and teaches the fundamental movements required in the sport. Students should expect to learn some officiating and etiquette of the sport and acquire the ability to fence at the novice level. The instructor will use any combination of the following: instructional videos, written handouts, guest fencers for demonstrations, drills, and group and individual instruction.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 105 - Aerobics and Basic Conditioning
Introduce students to fitness and healthy lifestyles. The course is designed to provide students with four lectures and multiple cardiovascular workouts. The lectures include cardiovascular endurance, cardiovascular diseases, body composition, nutrition, and weight management. The class also teaches students how to use cardiovascular equipment and how to design an aerobic fitness program. The course is geared for beginners, yet all students will be helped on an individual basis (therefore advanced individuals can also participate).

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHED 107 - Social Dance**

Credits: 1 (NR)
Provides a knowledge base of dance fundamentals and skill development in various ballroom dances and includes basic rhythms, dance positions, floor alignments, techniques of leading and following, and maintenance of dance frame in partner dancing.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHED 108 - Weight Training and Body Conditioning**

Credits: 1 (NR)
Introduces students to fitness and healthy lifestyles. The course is designed to provide students with an overview of the various types of weight training but primarily emphasizes circuit weight training method. There will usually be a brief lecture each week with a longer one two or three times during the semester. The lectures include the five health-related components of physical fitness, nutrition, and weight management. The class also teaches students how to use resistance and cardiovascular equipment, and how to design fitness programs. The course is designed for beginners, yet all students will be helped on an individual basis (therefore advanced individuals can also participate).

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHED 110 - Beginning Swimming**

Credits: 1 (NR)
Develops a knowledge base and basic swimming skills for the weak swimmer and nonswimmer, and make them water safe. These skills include, but are not limited to, locomotion and propulsive movements in a prone and supine position, breath control, rhythmic breathing, beginning diving techniques, personal safety, and rescue skills to maintain a water-safe environment.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
PHED 113 - Latin Dance

Credits: 1 (NR)
Provides students with a knowledge base of dance fundamentals and skill development in various Latin dances and includes basic rhythms, dance positions, floor alignments, techniques of leading and following, and maintenance of dance frame in partner dancing.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 118 - Advanced Life Guarding

Credits: 1 (NR)
Introduces and develops skills and knowledge necessary to become an American Red Cross-certified lifeguard. Focus is on training participants in aquatic facility and patron safety, in-water rescue skills, and physical conditioning. It teaches the lifeguard candidates to prevent, recognize, and respond to aquatic-related emergencies.

Prerequisite(s): PHED 150 or permission of instructor

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 120 - Introduction to Basketball

Credits: 1 (NR)
Introduces individuals to the basic elements of basketball. This includes dribbling, passing, shooting, tactics, and strategy.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12

PHED 127 - Social Dance II

Credits: 1 (NR)
Provides an introduction to the tango and additional patterns for the fox trot, waltz, cha-cha, rumba, and Eastern swing.

Prerequisite(s): PHED 107 or permission of instructor

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 128 - Fencing II

Credits: 2 (NR)
Reviews the advanced footwork and handwork techniques learned in Fencing I and expands on the third component of the sport,
strategic tactics. Students are introduced to the rules and protocol of competitive fencing and use electric scoring equipment and electric fencing gear.

**Prerequisite(s):** PHED 103 or permission of instructor

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

**PHED 129 - Introduction to Yoga**

Credits: 1 (NR)  
Introduces students to the practice of Hatha yoga. Class emphasis will be on learning yoga asanas (postures) and pranayama (breathing exercises) to enhance physical fitness and mental concentration.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**PHED 130 - Intermediate Yoga**

Credits: 1 (NR)  
Class emphasis will be on mastering yoga asanas (postures) and pranayama (breathing techniques) to enhance physical fitness and mental concentration. Students will learn 10 new yoga poses and practice the complete Sun Salutation.

**Prerequisite(s):** PHED 129 or permission of instructor

**Notes:** Expands on the yoga practices taught in PHED 129.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

**PHED 131 - Introduction to Pilates**

Credits: 1 (NR)  
Provides the history and basic foundations of Pilates including an introduction to beginning Pilates exercises and their proper execution; exploration of modifications for certain exercises and the various props which may be used in the group class setting.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 21  
**When Offered:** Fall, Spring

**PHED 134 - Self-Defense for Men and Women**

Credits: 1 (NR)  
A practical self-defense course designed for students with little or no background in martial arts or self-defense. Defensive and
offensive techniques are taught to prepare students for any potentially dangerous event they may encounter. The course will also improve student's physical and mental fitness.

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### PHED 135 - Self-Defense for Men and Women II

Credits: 1 (NR)  
A continuing practical self-defense course designed for students with a basic self-defense skill level or minimal martial arts experience. More advanced defensive and offensive techniques will be taught building on the student's previous training. Continued improvement in the student's physical and mental fitness will also be emphasized.

**Prerequisite(s):** PHED 134 or minimal martial arts experience.

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### PHED 136 - Tae Kwon Do

Credits: 1 (NR)  
A beginner-level course designed to develop basic skills of Tae Kwon Do, a Korean martial art that predominantly emphasizes kicking.

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### PHED 137 - Intermediate Tae Kwon Do

Credits: 1 (NR)  
An intermediate-level course that continues to develop basic skills of Tae Kwon Do. Course instruction continues to focus on the student's mental development, as well as physical training.

**Prerequisite(s):** PHED 136 or permission of instructor

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0
PHED 138 - Brazilian Jiu-Jitsu

Credits: 1 (NR)
A practical self-defense course instructing students in Brazilian Jiu-Jitsu techniques designed for students who have no prior experience in martial arts or Brazilian Jiu-Jitsu. Brazilian Jiu-Jitsu's primary goal is to give advantage to those who use correct form, posture, and technique over strength.

Notes: Fee required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 139 - Brazilian Jiu-Jitsu II for Men and Women

Credits: 2 (NR)
A beginner-to-intermediate-level course teaching techniques in Brazilian Jiu-Jitsu. Students will learn specific defensive techniques to be used against an attacker along with escapes and submissions from a variety of different attacks. Students will participate in basic sparring with particular attention to safety. Students will also undergo an intensive training and conditioning routine.

Prerequisite(s): PHED 138 or permission of instructor

Notes: Fee required.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PHED 140 - Golf

Credits: 1 (NR)
A practical course designed for students with little or no golf knowledge. The course involves activities to teach students basic golf terms, rules, and techniques for the full swing, putting, chipping, and pitching, as well as playing on a golf course.

Notes: Fee required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 144 - Intermediate Golf

Credits: 2 (NR)
A practical course designed for students with basic golf knowledge and skills. The course will include course strategies, course management, the proper use of the rules, club selection, speed of play, skill building, and different golf formats.

Prerequisite(s): PHED 140 or permission of instructor
Notes: Fee required.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

**PHED 145 - Beginning Judo for Men and Women**

Credits: 1 (NR)
This is an introduction to Judo in which students will learn basic body mechanics of throwing, sweeping, grappling, and submission. Students will learn the fundamentals in these areas both for self-defense and sport. The history of judo, rules of the sport, and proper safety and falling techniques will be presented.

Notes: Fee required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHED 146 - Introduction to Badminton**

Credits: 1 (NR)
A practical course designed as an introduction to badminton. Students learn badminton terms; scoring rules; and techniques for forehand, and backhand, and the serve. Students are also introduced to basic strategy for singles and doubles play.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHED 147 - Advanced Tae Kwon Do**

Credits: 1 (NR)
Advanced-level course that continues to enhance and refine skills of Tae Kwon Do. Students develop more extensive jump and spin kicks, as well as combinations of the same. Provides brown to black belt levels of promotion and continues to focus on each student's mental development and physical training.

Prerequisite(s): PHED 137 or permission of instructor

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**PHED 149 - Tai Chi**

Credits: 1 (NR)
A beginner-level course designed to increase awareness of the mind and body. Students will be introduced to basic principles of Chi (energy) and Yin Yang (polarity) and how these apply to their bodies through practicing the Tai Chi Chih movements.
PHED 150 - Intermediate Swimming

Credits: 1 (NR)
A course designed to build on basic-level swimming skills by providing practice for confidence, refinement of coordination, and improvement of other aquatic skills. Presents more advanced swimming strokes and focuses on physical conditioning and aquatic safety.

PHED 151 - Introduction to Tennis

Credits: 1 (NR)
A practical course designed as an introduction to tennis. Involves activities to teach students tennis terms, rules, scoring, techniques for the forehand and backhand ground strokes, volley, overhead, and serve, as well as basic strategy for singles and doubles.

PHED 153 - Intermediate Tennis

Credits: 1 (NR)
A practical course designed for the novice tennis player. Involves such activities as control of pace, direction, and depth on forehand and backhand ground strokes; the use of topspin and under spin; tactical use of the volley; styles of play; and strategy for singles and doubles.

Prerequisite(s): PHED 151 or demonstrated ability

PHED 155 - Introduction to Springboard Diving

Credits: 2 (NR)
A beginner-level course designed to increase awareness of the sport of diving, safety issues pertaining to competitive and recreational diving, competition formats, and history and evolution of the sport and scoring systems. Students will be introduced to fundamental skill progressions leading to basic dives.

Prerequisite(s): PHED 150 or permission of instructor
PHED 156 - Intermediate Springboard Diving

Credits: 2 (NR)
Students build on the fundamental skill progressions and perform more advanced skills and dives than in the introductory course (PRLS 155). Designed to increase awareness of the sport of diving, safety issues pertaining to competitive and recreational diving, competition formats, history and evolution of the sport, and scoring systems.

Prerequisite(s): PHED 155 or permission of instructor

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PHED 157 - Aikido for Men and Women

Credits: 1 (NR)
Designed for students who have no prior experience in martial arts. Can benefit those with a solid martial arts background. Mind-body techniques useful to all athletes and students are taught in a classical martial art self-defense context. Involves mind-body coordination exercises, and solo and partner practice. Gives all students a chance to execute throws, locks, and pins, both as the thrower and the one who takes falls.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 158 - Underwater Hockey

Credits: 1 (NR)
Designed to provide basic instruction in the fundamentals of underwater hockey. Students learn free diving and snorkeling activities in preparation for underwater hockey. They will learn about and experience physiological reactions to aquatic submersion. Significant attention throughout this course will be given to safety issues related to underwater training, emphasizing current and lifelong skills.

Prerequisite(s): PHED 150 or permission of instructor

Notes: Fee required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 159 - Advanced Swimming
A course designed to build on intermediate-level swimming skills by providing practice to refine and perfect swimming strokes, so that students swim with more ease, efficiency, power, and smoothness over greater distances. Focuses on developing a higher level of fitness and maintaining better physical conditioning. Introduces other aquatic activities to enrich the class and broaden the horizons of the participant.

**Prerequisite(s):** PHED 150 or permission of instructor

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### PHED 160 - Intermediate Tai Chi

Credits: 1 (NR)  
A second-level course for students to learn Tai Chi Weapon (Tai Chi Straight Sword), as well as practice the basic principles of Tai Chi. Students will increase awareness of the mind and body.

**Prerequisite(s):** PHED 149 or permission of instructor

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### PHED 162 - Introduction to Bowling

Credits: 1 (NR)  
Students will learn the sport of 10-pin bowling. Topics covered are bowling etiquette, history of bowling, playing rules for league members, scoring, different approaches to the game, and the appropriate equipment for these approaches. Inexperienced and experienced bowlers are welcome to participate.

**Notes:** Fee required.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

### PHED 163 - Karate

Credits: 1 (NR)  
American Kenpo Karate is the combination of art and science. Emphasizes techniques, forms (kata), and sets (drills). All the techniques are related by motion and principles. Each technique builds on the previous one, creating a web of knowledge.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0
PHED 164 - Intermediate Karate

Credits: 1 (NR)
Second-level course in American Kenpo Karate. Students review information and refine skills developed in the introductory class, as well as learn new forms and techniques to increase skill performance at the next level.

Prerequisite(s): PHED 163 or permission of instructor

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 165 - Introduction to Racquetball

Credits: 1 (NR)
A practical course designed as an introduction to racquetball. Involves activities to teach students basic racquetball terms, rules, scoring, safety, and techniques for the forehand, backhand, overhead, and serve, as well as singles and doubles.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 166 - Intermediate Racquetball

Credits: 1 (NR)
A practical course designed for the novice racquetball player. Course involves activities to teach students intermediate skills, including ceiling shots, kill shots, passing shots, back wall strokes, advanced serves, court positions, and tactics and strategies for singles and doubles.

Prerequisite(s): PHED 165 or permission of instructor

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

PHED 167 - Advanced Concepts and Strategies in Bowling

Credits: 1 (NR)
Students will learn advanced concepts and strategies in the sport of Ten Pin Bowling. Topics covered are equipment, mental preparation, spare conversions, practice regimens, and strategies for different lane conditions. This course is intended for experienced bowlers.

Prerequisite(s): PHED 162 or permission of instructor

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
PHED 169 - Intermediate Judo for Men/Women

Credits: 2 (NR)
This is a second level course with the emphasis placed on executing proper skills and movements and not the contact itself. The nature of this course incorporates both offensive and defensive movements, and these actions are accepted as part of the class. Excessive force, violence, or aggression will not be tolerated.

Prerequisite(s): PHED 145 or permission of instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PHED 174 - Introduction to Volleyball

Credits: 1 (NR)
Introduces students to fundamental knowledge and basic skills of volleyball.

Hours of Lecture or Seminar per week: 1
When Offered: Fall.

PHED 176 - Introduction to Cricket

Credits: 1 (NR)
This course is designed to introduce individuals to the basic of Cricket. This includes bowling, batting, fielding, umpiring, and strategy.

Hours of Lecture or Seminar per week: 1
When Offered: Fall, Spring.

PHED 178 - Intermediate Pilates

Credits: 1 (NR)
Provides students with advanced knowledge and skills in Pilates techniques and exercises.

Prerequisite(s): PHED 130 or permission of instructor.

Hours of Lecture or Seminar per week: 1
When Offered: Fall.

PHED 179 - Introduction to Krav Maga

Credits: 1 (NR)
Introduces students to the principles and practice of Krav Maga, an Israeli system of self-protection. Involves knowledge of threat response, skill training in self-protection, and mental preparation for defensive tactics. Prepares students in appropriate protective
action in situations of threat or attack.

Hours of Lecture or Seminar per week: 1  
Hours of Lab or Studio per week: 0  
When Offered: Fall.

**PHED 181 - Introduction to Meditation**

Credits: 1 (NR)  
Introduces students to philosophical foundations of meditation. Guides in the practice of meditation and its application to daily mental focus and concentration.

Hours of Lecture or Seminar per week: 1  
Hours of Lab or Studio per week: 0  
When Offered: Fall.

**PHED 182 - Intermediate Soccer**

Credits: 1 (NR)  
Discuss and develops critical soccer skills and strategies used in recreational and competitive games.

Prerequisite(s): PHED 102 or Permission of Instructor.

Hours of Lecture or Seminar per week: 0.5  
Hours of Lab or Studio per week: 0.5  
When Offered: Fall

**PHED 200 - Professional Dimensions of Health, Recreation, and Physical Education**

Credits: 3 (NR)  
Traces historical foundations of health, recreation, physical education, and sport.

Notes: Open to nonmajors.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**PHED 201 - Developmental Motor Patterns**

Credits: 3 (NR)  
Analyzes motor-skill development and prescription of activities from immature to mature stages.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0
PHED 202 - Teaching Skillful Movement

Credits: 3 (NR)
Covers planning and presenting lessons on numerous motor skills using varied teaching strategies in a peer teaching setting.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHED 230 - Asian Martial Arts: Origin and Development

Credits: 3 (NR)
Introduction to martial arts of East, South, and Southeast Asia. Lectures address martial arts from a historical, philosophical, biographical, warfare, and sport perspective.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHED 250 - Water Safety Instruction

Credits: 2 (NR)
Introduces planning, organizing, and executing American Red Cross swimming and water safety courses. Focus is on educational methods, approaches, and skill development applicable to swimming and water safety instruction.

Prerequisite(s): PHED 150 and instructor evaluation

Notes: Fee required.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PHED 255 - Basic Scuba Diving

Credits: 2 (NR)
Provides training toward certification as an open water SCUBA diver. The course emphasizes the learning of snorkeling (free diving introduction) and SCUBA skills. Safe diving skills, the physics of diving, equipment care and maintenance, diving fitness, underwater navigation, record keeping, and other basic SCUBA knowledge will be covered in the course. On successful completion of the course, students will be qualified for open water certification by Scuba Schools International (SSI).

Notes: Fee required.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
PHED 273 - Net and Target Games

Credits: 2 (NR)
Skill and content knowledge in net and target games. Includes skill progression, strategies, officiating, and authentic assessment in games such as volleyball, golf, tennis, and badminton.

Notes: Open only to PHED majors.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 2

PHED 274 - Dance and Educational Gymnastics

Credits: 2 (NR)
Skill and content knowledge in dance, rhythms, and educational gymnastics.

Notes: Open to BPRE and BSED PHED majors only.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 2

PHED 275 - Field and Invasion Games

Credits: 2 (NR)
Skill and content knowledge in field and invasion games. Includes skill progression, strategies, officiating, and authentic assessment in activities such as softball, basketball, soccer, field events, and Ultimate Disc.

Notes: Open to BPRE and BSED PHED majors only.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 2

PHED 306 - Psychomotor Learning

Credits: 3 (NR)
Analyzes psychological aspects, learning theory, and practice conditions for learning motor skills.

Notes: Open only to PHED and HFRR majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHED 308 - Adapted Physical Education
Credits: 3 (NR)
Introduces disabilities in public schools. Covers national standards, federal legislation, IEPs, and developmental inclusion models.

Prerequisite(s): BSED status or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHED 340 - Social and Cultural Issues in Physical Education**

Credits: 3 (NR)
Studies contemporary and historical perspectives on socio-cultural and philosophical issues influencing American public schooling and physical education teacher preparation, including race, culture, ethnicity, nationality, globalization, socioeconomic status, gender, sexuality, ability, obesity, and urbanization.

Fulfills writing intensive requirement in the major.

**PHED 364 - Strength Training: Concepts and Applications**

Credits: 3 (NR)
Provides students with an opportunity to develop an in-depth understanding of the principles of strength training and conditioning, including anatomical and physiological considerations, lifting techniques, equipment selection, program development and evaluation, and weightlifting safety.

Equivalent to KINE 360

Prerequisite(s): BIOL 124 and BIOL 125

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHED 365 - Measurement and Evaluation of Physical Fitness**

Credits: 3 (NR)
Covers selection, administration, evaluation, and construction of measurements and evaluation instruments and techniques in physical education. Also covers statistical analysis of data and survey of selected instruments.

Fulfills writing intensive requirement in the major.

Equivalent to KINE 370

Prerequisite(s): BIOL 124 and 125
PHED 403 - Elementary School Instruction in Physical Education

Credits: 3 (NR)
Covers content, knowledge, and teaching methods for K-6 physical education. Requires field experience.

Prerequisite(s): PHED 201, 202, 273, 274, 275. Must be taken within one year of student teaching. Open to students with BSED status only.

Corequisite(s): PHED 306.

PHED 404 - Middle and High School Instruction in Physical Education

Credits: 3 (NR)
Examines school curriculum, assessment, content, and teaching practices for middle and high school physical education programs. Requires field experience.

Prerequisite(s): PHED 201, 202, 273, 274, 275, 306, and 403; and BSED status. Prerequisite enforced by registration system.

PHED 410 - Social/Psychological Aspects of Health and Fitness

Credits: 3 (RD)
Covers research, trends, and techniques of health and fitness from a behavioral perspective.

PHED 415 - Student Teaching in Physical Education

Credits: 9-12 (NR)
Provides supervised clinical experience for a full semester in approved schools. Requires experiences in elementary (seven weeks) and secondary (seven weeks) school settings. Includes participation of one week in preservice workshops and related activities, and weekly seminar sessions.

Prerequisite(s): Completion of all courses in approved program, and acceptance into student teaching
PHED 442 - Practicum in Physical Education

Credits: 1-3 (NR)
Provides supervised professional practice in a selected area of interest.

Prerequisite(s): 84 hours or 54 hours and Permission of Instructor.

Notes: May be repeated for up to 3 credits. Each credit requires a minimum of 60 hours of participation in the specialty over a period of six weeks. Areas selected with faculty advisor approval.

PHED 480 - Special Topics

Credits: 1-3 (NR)
See course description in the Schedule of Classes. Selected topics reflect interest in specialized areas of exercise science or health promotion.

PHED 499 - Independent Study in Physical Education and Fitness

Credits: 1-3 (NR)
Study of a problem area in physical education research, theory, or practice under direction of faculty member.

Prerequisite(s): Completion of 90 hours and Permission of Chair.

Notes: May be repeated, but no more than 3 total credits may be earned.

PHED 670 - Analysis of Teaching in Physical Education

Credits: 3 (NR)
Presents variety of research techniques for studying teacher and learner behaviors in physical education, engaging the teacher as researcher and grant writer. Goal is to prepare teachers to be leaders in their field.
PHED 672 - Curriculum and Assessment in Physical Education

Credits: 3 (NR)
Provides knowledge of curriculum models and assessment strategies in standards-based physical education program. Studies curriculum models such as sport education and adventure education. Examines traditional and alternative assessment.

PHED 673 - Motor Development for Special Populations

Credits: 3 (NR)
Provides knowledge that focuses on individuals with orthopedic, sensory, and learning disabilities in physical education setting. Areas of focus include development of motor patterns and skills assessment, and planning and instruction for students with disabilities.

PHED 680 - Mentoring and Supervising in Physical Education

Credits: 3 (NR)
Prepares mentors and supervisors of preservice and in-service teachers in physical education. Topics include professional dispositions, assessment and evaluation, adult learners, counseling and communication, providing feedback, and reflection and inquiry into the profession.

Prerequisite(s): PHED 670

Physical Sciences (PSCI)

Offered by the College of Science

PSCI 701 - Frontiers of Physical Sciences

Credits: 3 (NR)
Each semester, the course will cover between four and six topics considered to be at the frontiers of the physical sciences - the key questions that are of interest to researchers today. The topics will be chosen from interdisciplinary areas, such as nanoscience,
astroparticle physics, nonlinear dynamics, and neuroscience. Approximately two to three weeks will be spent on each topic, and the specific topics may vary each semester. The course includes guest lectures given by faculty who are doing research in each area. Assignments include readings from the current literature as well as projects and class presentations.

**Prerequisite(s):** Admission to physical sciences doctoral program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PSCI 702 - Research Methods**

Credits: 3 (NR)  
This course trains students in research methodologies, techniques, and data analysis methods in the physical sciences. Covers approaches for outlining and synthesizing a problem, techniques for measurement and analysis, and methods used for data analysis and interpretation.

**Prerequisite(s):** Admission to physical sciences doctoral program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PSCI 703 - Frontiers of Physical Sciences**

Credits: 1 (RD)  
Combines invited seminars from faculty (internal and external) with graduate student seminars. Presentation at a seminar is a requirement for advancement to candidacy in the physical sciences doctoral program.

**Prerequisite(s):** Admission to physical sciences doctoral program.

**Notes:** May be repeated three times.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0

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**PSCI 998 - Dissertation Proposal**

Credits: 1-6 (RD)  
Covers development of a research proposal under the guidance of a dissertation director and the doctoral committee. The proposal forms the basis for the doctoral dissertation.

**Prerequisite(s):** Admission to the PhD in Physical Sciences.

**Notes:** May be repeated as needed; however, no more than a total of 24 credits in PSCI 998 and 999 may be applied toward satisfying doctoral degree requirements. Out of 24, no more than 12 credits of PSCI 998 may be applied.

**Hours of Lecture or Seminar per week:** 0
PSCI 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral research performed under direction of dissertation director.

Prerequisite(s): Admission to the PhD in Physical Sciences.

Notes: May be repeated as needed, but no more than a total of 24 credits in PSCI 998 and 999 may be applied toward satisfying doctoral degree requirements.

Physics (PHYS)

Offered by the College of Science

PHYS 101 - Light and Sound in Our World

Credits: 3 (NR)
Nature of light, color, sound, electromagnetic spectrum, optical instruments, mechanisms of vision and hearing, color addition and subtraction, synthesis of musical sounds, interference of waves, polarization, Doppler effect, lasers, holography.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 102 - Sports Physics

Credits: 3 (NR)
Introduction to laws of physics in context of sports. Physics topics to be studied include two-dimensional motion, forces, conservation of energy, and momentum in the application to sports. Sports include football, basketball, baseball, swimming, and tennis.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 103 - Physics and Everyday Phenomena I
The course uses basic physics concepts from the areas of mechanics and thermodynamics to explain a wide range of everyday phenomena, such as how we walk and drive, how a ship floats, how clothing keeps us warm, and why it rains when we have a low pressure system.

Fulfills general education requirement in natural science (lab).

**Notes:** For non-science majors.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

**PHYS 104 - Physics and Everyday Phenomena II**

Credits: 4 (NR)  
The course uses basic physics concepts from the areas of light, sound, electricity, magnetism, and modern physics to explain a wide range of everyday phenomena. Topics include how we speak, hear, and see, what to do if the circuit breaker keeps tripping, how your computer stores and displays data, how rainbows and northern lights form, and the basic nature of matter.

Fulfills general education requirement in natural science (lab).

**Prerequisite(s):** PHYS 103 or permission of instructor.

**Notes:** For non-science majors.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3

**PHYS 111 - Introduction to the Fundamentals of Atmospheric Science**

Credits: 3 (NR)  
An overview of the Earth's atmosphere, its history, and the physical and chemical processes that determine its characteristics. The focus is on key concepts from thermodynamics, radiation, chemistry, and dynamics that are essential for understanding the state, variability, and long term evolution of the atmosphere, especially in the context of comparisons with other planetary atmospheres.

Fulfills general education requirement in natural science (lab).

Equivalent to CLIM 111

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHYS 112 - Introduction to the Fundamentals of Atmospheric Science Lab**

Credits: 1 (NR)  
Laboratory course associated with PHYS 111. Study of the Earth's atmosphere based on concepts taken from thermodynamics, radiation transport, chemistry, and dynamics.
Fulfills general education requirement in natural science (lab).

Equivalent to CLIM 112

Corequisite(s): PHYS 111

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 1

**PHYS 121 - Uses of Physics**

Credits: 1 (NR)
Describes the uses of physics to a number of disciplines and professions, including medicine, information technology, energy, and environmental technology.

Notes: Introductory course intended for both majors and nonmajors.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHYS 122 - Inside Relativity**

Credits: 1 (NR)
Introductory course describing Einstein’s theories of special and general relativity.

Notes: Intended for majors and nonmajors.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHYS 123 - Inside the Quantum World**

Credits: 1 (NR)
Introductory course describing quantum theory.

Notes: Intended for majors and nonmajors.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHYS 124 - Experimental Explorations in Physics**
Introductory nonmathematical course intended primarily for physics majors. Experimental studies of phenomena in mechanics, electricity and magnetism, and optics. Stresses development of familiarity with methods and techniques of measurement and with data evaluation.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 2

**PHYS 160 - University Physics I**

Credits: 3 (NR)
First semester of three-semester, calculus-based introductory physics sequence, designed primarily for science and engineering majors. Mechanics.

Fulfills general education requirement in natural science (lab).

Corequisite(s): MATH 114.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 161 - University Physics I Laboratory**

Credits: 1 (NR)
Experiments in mechanics, including techniques for recording, graphically and statistically analyzing, and reporting data.

Fulfills general education requirement in natural science (lab).

Corequisite(s): PHYS 160 and MATH 114

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 3

**PHYS 225 - Problems in Physics I**

Credits: 1-3 (RD)
Individual study of physics problems of current interest.

Prerequisite(s): 24 credits and 2.50 GPA in physics and mathematics.

Notes: May be taken three times for credit.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0
PHYS 243 - College Physics

Credits: 3 (NR)
PHYS 243 is prerequisite to PHYS 245. Two-semester basic physics course with emphasis on topics of classical and modern physics of particular importance to science majors. Principles of mechanics, heat, electricity, magnetism, optics, and atomic and nuclear physics are discussed.

Fulfills general education requirement in natural science (lab).

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 244 - College Physics Lab

Credits: 1 (NR)
Laboratory portion of two-semester basic physics course.

Fulfills general education requirement in natural science (lab).

Corequisite(s): PHYS 243 for 244, and 245 for 246.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 3

PHYS 245 - College Physics

Credits: 3 (NR)
Two-semester basic physics course with emphasis on topics of classical and modern physics of particular importance to science majors. Principles of mechanics, heat, electricity, magnetism, optics, and atomic and nuclear physics are discussed.

Fulfills general education requirement in natural science (lab).

Prerequisite(s): PHYS 243

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 246 - College Physics Lab

Credits: 1 (NR)
Laboratory portion of two-semester basic physics course.

Fulfills general education requirement in natural science (lab).

Corequisite(s): PHYS 243 for 244, and 245 for 246.
**PHYS 251 - Introduction to Computer Techniques in Physics**

Credits: 3 (NR)
Introduction to using computers in physics based on examples from mechanics and astronomy.

Fulfills general education requirement in information technology (all except ethics).

Prerequisite(s): PHYS 160.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PHYS 260 - University Physics II**

Credits: 3 (NR)
Waves, electricity, and magnetism.

Fulfills general education requirement in natural science (lab).

Prerequisite(s): PHYS 160 with grade of C or better (2.00)

Corequisite(s): MATH 213

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PHYS 261 - University Physics II Laboratory**

Credits: 1 (NR)
Experiments in mechanics, electricity, and magnetism, including techniques for recording, graphically and statistically analyzing, and reporting data.

Fulfills general education requirement in natural science (lab).

Prerequisite(s): PHYS 161

Corequisite(s): MATH 213 and PHYS 260

**Hours of Lecture or Seminar per week:** 1-12
**Hours of Lab or Studio per week:** 3

**PHYS 262 - University Physics III**
Thermodynamics, optics, and modern physics. Fulfills general education requirement in natural science (lab).

**Prerequisite(s):** PHYS 260 with grade of C or better (2.00)

**Corequisite(s):** MATH 214

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PHYS 263 - University Physics III Laboratory**

Credits: 1 (NR)

Experiments in optics and modern physics, including techniques for recording, graphically and statistically analyzing, and reporting data.

Fulfills general education requirement in natural science (lab).

**Prerequisite(s):** PHYS 261

**Corequisite(s):** PHYS 262

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 3

**PHYS 265 - Advanced University Physics II Laboratory**

Credits: 2 (NR)

Credit may be received for PHYS 261 or 265. Experiments in mechanics, electricity, and magnetism with emphasis on data analysis using spreadsheets and Matlab.

**Corequisite(s):** MATH 213 and PHYS 260.

**Hours of Lecture or Seminar per week:** 0
**Hours of Lab or Studio per week:** 3

**PHYS 266 - Introduction to Thermodynamics**

Credits: 1 (NR)

Students may not receive credit for both PHYS 262 and 266. Laws of thermodynamics, kinetic theory of gases, heat engines, and entropy.

**Prerequisite(s):** PHYS 260.
**PHYS 303 - Classical Mechanics**

Credits: 3 (NR)
Motion of a particle in one, two, and three dimensions; systems of particles; noninertial coordinate systems; and equations of Lagrange and Hamilton.

Prerequisite(s): PHYS 262 and MATH 214 or permission of instructor.

**PHYS 305 - Electromagnetic Theory**

Credits: 3 (NR)
Interaction of static charges, interaction of stationary currents, electromagnetic induction, and Maxwell's equations.

Prerequisite(s): PHYS 260

Corequisite(s): MATH 214

**PHYS 306 - Wave Motion and Electromagnetic Radiation**

Credits: 3 (NR)
Vibrating string, plane waves, interference, diffraction, polarization, electromagnetic waves, dispersion, and relativity.

Prerequisite(s): PHYS 262

Corequisite(s): MATH 214.

**PHYS 307 - Thermal Physics**

Credits: 3 (NR)
Classical concepts of energy and temperature, basic definitions, first and second laws of thermodynamics, properties of pure substances, and equations of state. Introduction to classical and quantum statistics and their application to physical systems.
Prerequisite(s): PHYS 262.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 308 - Modern Physics with Applications

Credits: 3 (NR)
Study of modern physics with emphasis on applications. Topics include introductory quantum physics; modern optics; lasers; binding and energy bands in solids; electrical, thermal, and magnetic properties of solids; semiconductors; radioactivity; nuclear reactions; radiation detectors; and applications of nuclear physics to other sciences.

Prerequisite(s): PHYS 262

Corequisite(s): MATH 214

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 310 - Physics of Semiconductor Materials and Processing

Credits: 3 (NR)
Survey of the electronic and structural properties of semiconductors and the physics of semiconductor processing. Topics to be discussed include crystal growth, crystal defects, thin films, thermal properties, lithography, and characterization.

Prerequisite(s): PHYS 160, 260, and 262; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 326 - Problems in Physics II

Credits: 1-3 (RD)
Individual study of physics problems of current interest.

Notes: May be taken three times for credit.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

PHYS 328 - Introduction to Astrophysics

Credits: 3 (NR)
Topics include physical concepts; magnitudes of stars; Hertzsprung-Russell diagram; stellar radiation; stellar structure and stellar
evolution; white dwarfs, red giants, supernovas, neutron stars, black holes; interstellar matter, dust, and molecules; cosmic rays and magnetic fields; galactic structure, galaxies, quasars, and intergalactic matter; high energy astrophysics, cosmology, and general relativity; and models of the universe.

Equivalent to ASTR 328

Prerequisite(s): PHYS 262 and MATH 214.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 331 - Fundamentals of Renewable Energy**

Credits: 3 (NR)

Introduces the physical principles for a range of renewable energies, including solar, wind, hydropower and geothermal. Demonstrates how the application of methods and principles of physics allow us to understand the basic operation, advantages, limitations and relative merits of various renewable energy sources. Designed for students majoring in the sciences or engineering but useful for students interested in science policy, business, global change and sustainable development. Designated a Green Leaf Course.

Prerequisite(s): PHYS 262 or 266 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 370 - Molecular Biophysics**

Credits: 3 (NR)

Offers a broad introduction into molecular biophysics. Demonstrates that the application of methods of physics provides a unique opportunity to tackle complex biological programs. Mainly designed for students majoring in physics or chemistry but also useful for biology majors interested in bioinformatics and computational biology.

Equivalent to BINF 470

Prerequisite(s): PHYS 307, or CHEM 331 and CHEM 332, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 385 - Materials Science with Applications to Renewable Energy**

Credits: 3 (NR)

Introduction to basic concepts and methods of materials science. Review of metallic alloys and compounds, ceramic materials,
ionic solids, semiconductors, polymers, and nano-structured materials. Mechanical, thermal, electric, magnetic and optical properties of materials. Theoretical background and experimental methods of materials characterization. Various materials applications with emphasis on renewable energy. Designated a Green Leaf Course.

Equivalent to CDS 385

**Prerequisite(s):** PHYS 262 or 266 or 245 and a C or better in MATH 113

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PHY390 - Topics in Physics**

Credits: 1-4 (RT)  
Selected topics in physics not covered in fixed-content courses.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 0

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**PHY402 - Introduction to Quantum Mechanics and Atomic Physics**

Credits: 3 (NR)  
Experimental basis of quantum mechanics; the wave function; systems in one, two, and three dimensions.

Equivalent to PHYS 502

**Prerequisite(s):** PHYS 308, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PHY405 - Honors Thesis in Physics**

Credits: 3 (NR)  
Project chosen and completed under the guidance of a faculty member, which results in a thesis.

**Prerequisite(s):** 21 credits of physics courses including PHYS 262, 305, and 308; and admission to Physics Department Honors Program.

**Notes:** PHYS 405 is a prerequisite for PHYS 406. An oral progress report is required for PHYS 405. Oral and written presentations are required for PHYS 406. Students may receive no more than 6 credits of PHYS 405, 406, 408, and 409.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
PHYS 406 - Honors Thesis in Physics

Credits: 3 (NR)
Project chosen and completed under the guidance of a faculty member, which results in a thesis.

Prerequisite(s): PHYS 405.

Notes: PHYS 405 is a prerequisite for PHYS 406. An oral progress report is required for PHYS 405. Oral and written presentations are required for PHYS 406. Students may receive no more than 6 credits of PHYS 405, 406, 408, and 409.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 407 - Senior Laboratory in Modern Physics

Credits: 3 (NR)
Advanced experiments in modern physics: electronics, optics, condensed matter, and nuclear physics. Techniques for recording, graphically and statistically analyzing, and reporting data. Typical experiments include the Frank-Hertz experiment, Hall Effect, electron spin resonance, nuclear magnetic resonance and optical pumping.

Fulfills writing intensive requirement in the major.

Prerequisite(s): 21 credits of physics courses, including PHYS 305 and 308

Notes: This course meets the writing-intensive requirement.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 9

PHYS 408 - Senior Research

Credits: 2-3 (RD)
Work under guidance of faculty member on research project in experimental or theoretical physics.

Prerequisite(s): 21 credits of physics courses.

Notes: May be taken twice with permission of the Physics Department. Students may receive no more than 6 credits of PHYS 405, 406, 408, and 409.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 0

PHYS 409 - Physics Internship

Credits: 3 (RD)
On-the-job experience for physics majors in industry or government laboratories including summer programs.
**Prerequisite(s):** PHYS 262 or 266, and at least 12 credits at the 300-level or above of physics, astronomy, chemistry, engineering, or mathematics courses, and permission of the school.

**Notes:** May be taken twice with permission of the School of Physics, Astronomy, & Computational Sciences. Students may receive no more than 6 credits of PHYS 405, 406, 408, and 409.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

**PHYS 410 - Computational Physics I**

Credits: 3 (NR)  
Study and development leading to computer simulations of various physical systems. Requires the study and development of computational techniques and numerical algorithms to obtain both numerical results and visualization of these results. Application to individual physical processes taking place in a variety of physical streams.

Equivalent to PHYS 510

**Prerequisite(s):** PHYS 303 and 305

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHYS 412 - Solid State Physics and Applications**

Credits: 3 (NR)  
Crystal structures, binding, lattice vibrations, the free electron model, metals, semiconductors and semiconductor devices, superconductivity, and magnetism.

Equivalent to PHYS 512/CSI 687

**Prerequisite(s):** PHYS 402 or 502.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHYS 416 - Special Topics in Modern Physics**

Credits: 1 (NR)  
Topics of current interest in modern physics with emphasis on the breadth of physical understanding needed to approach many of today's problems. The course will also review all of undergraduate physics through assigned problems from the GRE test.

**Prerequisite(s):** 21 credits of physics courses.
PHYS 417 - Geophysics

Credits: 3 (NR)
Seismological and gravitational theory and application to an understanding of the Earth's interior. Geology requirement may be waived for physics and engineering students with sufficient background.

Equivalent to GEOL 417

Prerequisite(s): GEOL 101, 102, 201, 301; MATH 113, 114; and PHYS 160.

Corequisite(s): MATH 213 and PHYS 260, 261.

PHYS 428 - Relativity and Cosmology

Credits: 3 (NR)
Special relativity; four-dimensional space-time; general relativity; non-Euclidean geometries, geodesics, and field equations; tests of general theory of relativity; black holes; cosmology; models of the universe; remnant blackbody radiation; big bang cosmology; thermodynamics; and the universe.

Equivalent to ASTR 428

Prerequisite(s): MATH 214; and PHYS 303, 305, and 262; or permission of instructor.

PHYS 440 - Nuclear and Particle Physics

Credits: 3 (NR)
Accelerators, detectors and related electronics; nuclear and elementary particle structure; symmetries and conservation laws; the electromagnetic, weak, and hadronic interactions; nuclear models; the quark model; and nuclear science and technology.

Equivalent to PHYS 540

Prerequisite(s): PHYS 402 or 502.
PHYS 475 - Atmospheric Physics

Credits: 3 (NR)
Introduction to basic physical and chemical processes that operate in the Earth's atmosphere. Emphasis on those concepts that provide a global description of the current atmospheric state and those processes that relate to global change and atmospheric evolution. Topics include equilibrium structure, radiative transfer models, thermodynamics of various atmospheric layers, and the various processes defining these layers.

Equivalent to PHYS 575/CSI 655

Prerequisite(s): PHYS 260 and 262.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 502 - Introduction to Quantum Mechanics and Atomic Physics

Credits: 3 (NR)
Experimental basis of quantum mechanics, the wave function, and systems in one, two, and three dimensions.

Equivalent to PHYS 402

Prerequisite(s): PHYS 308, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 510 - Computational Physics I

Credits: 3 (NR)
Study and development leading to computer simulations of various physical systems. Requires the study and development of computational techniques and numerical algorithms to obtain both numerical results and visualization of these results. Application to individual physical processes taking place in a variety of physical systems.

Equivalent to PHYS 410

Prerequisite(s): PHYS 303 and 305

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 512 - Solid State Physics and Applications
Crystal structures, binding, lattice vibrations, the free electron model, metals, semiconductors and semiconductor devices, superconductivity, and magnetism.

Equivalent to PHYS 412/CSI 687

Prerequisite(s): PHYS 402 or 502.

PHYS 513 - Applied Electromagnetic Theory

Credits: 3 (NR)
Classical electromagnetic theory with applications. Topics include electrostatics, magnetic fields and materials, electromagnetic wave propagation, waveguides, transmission lines, radiation, and antennas.

Prerequisite(s): PHYS 305, 306; and MATH 313, 314 or equivalent.

PHYS 533 - Modern Instrumentation

Credits: 3 (NR)
Topics include sensors for radiation, particles, electric and magnetic fields, pressure, and motion; electronic instruments, computer data collection, instrumentation noise and noise reduction methods; and specialized instrumentation systems for various areas of applied physics.

Equivalent to CHEM 620

Prerequisite(s): PHYS 513 and an electronics course.

PHYS 540 - Nuclear and Particle Physics

Credits: 3 (NR)
Accelerators, detectors and related electronics; nuclear and elementary particle structure; symmetries and conservation laws; the electromagnetic, weak, and hadronic interactions; nuclear models; the quark model; and nuclear science and technology.

Equivalent to PHYS 440

Prerequisite(s): PHYS 402 or 502.
PHYS 575 - Atmospheric Physics I

Credits: 3 (NR)
Introduction to basic physical and chemical processes that operate in the Earth's atmosphere. Emphasis on those concepts that provide a global description of the current atmospheric state and those processes that relate to global change and atmospheric evolution. Topics include equilibrium structure, radiative transfer models, thermodynamics of various atmospheric layers, and the various processes defining these layers.

Equivalent to PHYS 475/CSI 655

Prerequisite(s): PHYS 305, 262, and 260 or equivalent.

PHYS 580 - Selected Interdisciplinary Topics

Credits: 3 (NR)
Selected interdisciplinary topics with a strong physics content not covered in fixed-content courses.

Notes: PHYS 580 cannot be used to satisfy degree requirements for PHYS (PhD), PHAE (MA) in the standard, applied physics, and engineering physics emphases.

PHYS 581 - Topics in Renewable Energy

Credits: 3 (NR)
The course covers the physical principles for a range of renewable energies, including solar, wind, hydropower and geothermal using mathematical and other types of analysis. The course demonstrates how the application of methods and principles of physics allow us to understand the basic operation, advantages, limitations and relative merits of various renewable energy sources.

Prerequisite(s): PHYS 262, PHYS 266, or permission of the instructor.

PHYS 590 - Selected Topics in Physics
Credits: 1-6 (RT)
Selected topics from recent theoretical or experimental developments and applications. Satisfies needs of professional community to keep abreast of current developments.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 0-6
Hours of Lab or Studio per week: 0

**PHYS 600 - Special Topics in Physics**

Credits: 1-6 (RT)
In-service course to strengthen and update teachers' knowledge of physics and astronomy.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**PHYS 611 - Electro-optics**

Credits: 3 (NR)
Optical modulators, display devices, types and operation of lasers, mode locking, Q-switching, photodetectors, optical fibers.

Prerequisite(s): PHYS 502 or 684, and 513 or 685.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 612 - Physics of Modern Imaging**

Credits: 3 (NR)
Study of imaging methods using acoustic and electromagnetic waves to probe extended objects, and mathematical transformations to produce images from scattered waves. Topics include classical imaging, physical optics, Fourier transform, holography, tomography, seismic mapping, underwater acoustic imaging and mapping, side-looking radar, antenna arrays, applicable computer methods.

Prerequisite(s): PHYS 513 or 685.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 613 - Computational Physics II**

Credits: 3 (NR)
Study of diverse physical systems with emphasis on modeling and simulation. Study and development of numerical algorithms
and techniques to obtain both numerical results and visualization of these results. Projects undertaken will draw from such areas as many-body orbital dynamics, molecular interactions, quantum systems, radiative transfer in high-temperature plasmas, stellar interiors, hydrodynamics, and cosmology.

Equivalent to CSI 780

**Prerequisite(s):** PHYS 303, 305, and 510; PHYS 502 or equivalent recommended.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHYS 614 - Thermodynamics and Kinetics of Materials**

Credits: 3 (NR)  
Advanced thermodynamics and physical kinetics with applications to materials science. The course covers an axiomatic formulation of thermodynamics, theory of phase transformations, kinetic theory of reactions and diffusion processes in solids, and interface phenomena. Possible applications considered in the course include processing and fabrication of semiconductor materials, metal oxidation and corrosion, diffusion-controlled phase growth in solid solutions, shape memory alloys, and small-size effects in physical properties of materials.

**Prerequisite(s):** MATH 113, 114, 213, 307; PHYS 262 or 266, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHYS 615 - Fundamentals of Materials Science**

Credits: 3 (NR)  
Covers fundamentals of materials science with emphasis on physical topics including crystal structure and symmetry, dislocation theory, theory of interfaces, multicomponent phase diagrams, theory of phase transformations, nano-materials, metallic glasses. Includes a term project, assignments from current literature and application of computation in materials science.

Equivalent to CSI 685

**Prerequisite(s):** CDS 385/PHYS 385 or undergraduate degree in physics, chemistry, materials, electrical or mechanical engineering or related disciplines; or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PHYS 620 - Continuum Mechanics**

Credits: 3 (NR)  
Study of continuum mechanics; topics include physical concepts, mathematical formulation and solution, elastic materials, ideal fluids, viscous fluids, waves in continuous media, turbulence, thermal convection, stability considerations, high-temperature gas flows, radiative processes for momentum and energy transport, shocks, and computational fluid dynamics.
Prerequisite(s): PHYS 510 and 303 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 630 - Introduction to Biophysics**

Credits: 3 (NR)
Introduces biophysics, focusing on physical and chemical concepts and their relation to rapidly expanding interdisciplinary interfaces among biology, chemistry, and physics. Reveals multiscale nature of biophysics, and includes exploration of macroscopic and microscopic applications.

Equivalent to BINF 740

Prerequisite(s): Undergraduate degree in physics or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 660 - Space Weather**

Credits: 3 (NR)
Overview of space weather including sun, heliosphere, magnetosphere, and ionosphere.

Equivalent to ASTR 660

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 676 - Atmospheric Physics**

Credits: 3 (NR)
Covers the basic conservation laws of mass, momentum, and energy, and a scaling analysis of the equations of motion and thermodynamics. Balanced flows in the atmosphere are discussed. Concepts of circulation and vorticity; the role of the atmospheric boundary layer in mass, momentum, and energy transfer; synoptic scale motions; and the role of gravity and Rossby waves in controlling the general circulation of the atmosphere are covered.

Prerequisite(s): PHYS 303, 305, and 308; and MATH 314.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 684 - Quantum Mechanics I**
Fundamental concepts, including one-dimensional solutions of Schrodinger's equations, operators in Hilbert space, observables, propagators, and harmonic oscillators.

Prerequisite(s): PHYS 305, 308; MATH 313 and 314, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 685 - Classical Electrodynamics I**

Credits: 3 (NR)
Deals with static and dynamic properties of electromagnetic fields as described by Maxwell's equations. Covers electrostatics, magnetostatics, boundary value problems, multipoles, time dependent fields, propagating wave solutions, and resonant structures.

Prerequisite(s): PHYS 305, 308; MATH 313 and 314, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 701 - Theoretical Physics**

Credits: 3 (NR)
Study of the physical basis for selection of particular mathematical tools in physics; topics include curvilinear coordinates, tensors, matrices, differential equations, special functions, complex variables, and group theory.

Prerequisite(s): Undergraduate degree in physics or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 703 - Seminar in Physics**

Credits: 1 (RD)
A general seminar course that combines invited seminars from faculty (both internal and external) with graduate student seminars.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PHYS 705 - Classical Mechanics**
Study of classical mechanics; topics include variational principles, constrained motion, Lagrangian and Hamiltonian mechanics, canonical transformations, and applications (central forces, rigid-body motion, oscillations).

**Prerequisite(s):** Undergraduate degree in physics or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PHYS 711 - Statistical Mechanics

Credits: 3 (NR)  
Topics include thermodynamics, kinetic theory, ensemble theory, quantum statistics, and applications.

**Prerequisite(s):** Undergraduate degree in physics or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PHYS 728 - Simulation of Large-Scale Physical Systems

Credits: 3 (NR)  
Study of diverse large-scale physical systems with emphasis on the modeling and simulation of these multifaceted systems. Study and development of numerical algorithms and techniques to obtain both numerical results and visualization of these results. Projects will be drawn from such areas as many-body dynamics, molecular dynamics and interactions, atmospheric structure and dynamics, high-temperature plasmas, stellar structure, hydrodynamics systems, galactic structure and interactions, and cosmology.

**Prerequisite(s):** PHYS 613 and CSI 717 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PHYS 736 - Computational Quantum Mechanics

Credits: 3 (NR)  
Study of the fundamental concepts of quantum mechanics from a computational point of view, review of systems with spherically symmetric potentials, many-electron-atom solutions to Schrodinger’s equation, electron spin in many-electron systems, atomic structure calculations, algebra of many-electron calculations, Hartree-Fock self-consistent field method, molecular structure calculations, scattering theory computations, and solid-state computations.

**Prerequisite(s):** PHYS 502, 510, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
PHYS 760 - Space Plasma Physics

Credits: 3 (NR)
Covers plasma processes involved in today's space physics research, including different regimes of plasma; basic concepts in kinetic, fluid, and MHD plasmas; and existent waves in these media. Also covers basics of shocks, discontinuities, transport and acceleration of particles such as cosmic rays, reconnection, and MHD instabilities.

Equivalent to ASTR 760

Prerequisite(s): PHYS 513 or 685, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 780 - Advanced Selected Topics in Physics

Credits: 3 (RT)
Selected topics in physics not covered in fixed-content physics courses.

Equivalent to CSI 789

Prerequisite(s): Permission of instructor.

Notes: May be repeated for credit as needed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 784 - Quantum Mechanics II

Credits: 3 (NR)
Advanced topics in quantum mechanics. Covers rotations, angular momentum, 3D solutions to Schrodinger's equations, symmetries, conservation laws, approximate methods, and spin mechanics.

Prerequisite(s): PHYS 684, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PHYS 785 - Classical Electrodynamics II

Credits: 3 (NR)
Advanced topics in electrodynamics. Covers radiation, scattering and diffraction, special relativity, relativistic particle dynamics, Lorentz transformation, 4-vectors, transformation of fields, charges and currents, Thomas precession, retarded potentials, and radiation from moving charges.
Prerequisite(s): PHYS 685, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PHYS 796 - Directed Reading and Research**

Credits: 1-6 (RT)
Reading and research on a specific topic in physics or related field under the direction of a faculty member.

Prerequisite(s): Admission to master's program, and permission of instructor.

Notes: May be repeated as needed.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

**PHYS 798 - Research Project**

Credits: 3 (RD)
Project chosen and completed under the guidance of a graduate faculty member, which results in an acceptable technical report.

Prerequisite(s): 9 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

**PHYS 799 - Master's Thesis**

Credits: 1-6 (RD)
Project chosen and completed under the guidance of a graduate faculty member, which results in an acceptable technical report and oral defense.

Prerequisite(s): 9 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

**PHYS 998 - Doctoral Dissertation Proposal**
Credits: 1-12 (RD)
Covers development of a research proposal under the guidance of a dissertation director and the doctoral committee. The proposal forms the basis for the doctoral dissertation.

Prerequisite(s): Admission to physics doctoral program and permission of advisor.

Notes: May be repeated as needed; however, no more than 24 credits in ASTR/PHYS 998 and ASTR/PHYS 999 may be applied toward satisfying doctoral degree requirements in the physics PhD program. Out of the 24, no more than 12 credits of ASTR/PHYS 998 may be applied.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

**PHYS 999 - Doctoral Dissertation**

Credits: 1-12 (RD)
Doctoral research performed under direction of dissertation director.

Prerequisite(s): Admission to doctoral candidacy in physics doctoral program and permission of advisor.

Notes: May be repeated as needed; however, no more than 24 credits in ASTR/PHYS 998 and ASTR/PHYS 999 may be applied toward satisfying doctoral degree requirements in the physics PhD program.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/IP

**Portuguese (PORT)**

**PORT 110 - Elementary Portuguese**

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

**PORT 210 - Intermediate Portuguese**

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Portuguese-speaking regions.
Prerequisite(s): PORT 110, appropriate placement score, or permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Provost (PROV)

PROV 103 - Language Support for Public Speaking

Credits: 1 (NR)
Academic language support course for Public Speaking. Focus on increasing students' comprehension and use of key grammatical structures, vocabulary, words forms, and reading/annotating strategies.

Equivalent to UNIV 103 (2011-2012 Catalog)

Notes: Restricted to Access students (ACCS)

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0
When Offered: Fall

PROV 104 - Language Support for World History

Credits: 1 (NR)
Academic language support course for World History. Focus on increasing students' comprehension and use of key grammatical structures, vocabulary, words forms, and reading/annotating strategies.

Equivalent to UNIV 104 (2011-2012 Catalog)

Notes: Restricted to Access students (ACCS).

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0
When Offered: Fall

PROV 105 - American Cultures

Credits: 3 (NR)
This course provides an introduction to US cultures with a focus on diversity within American society. The course uses the concept of culture as a basis for discussing differences in Americans' experience of family life, work, education, the arts, national and ethnic identities, gender, religion and more. Through ethnographic readings, literature, film and field projects, students develop a better understanding of similarities and differences across the
American experience.

Fulfills general education requirement in global understanding (ACCESS students only).

Equivalent to UNIV 105 (2011-2012 Catalog)

Prerequisite(s): Admission to the ACCESS program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Undergraduate Special.
When Offered: Spring

PROV 106 - Introduction to Research Methods for International Students

Credits: 0-3 (NR)
Academic research is the fundamental element of university-level education. Despite the variations in research disciplines, they all share basic concepts of academic inquiry. This course is designed to teach the methods, norms and procedures of undergraduate research in the humanities and social sciences. It should equip international students with the essential skills needed to successfully produce a quality academic paper.

Equivalent to UNIV 106 (2011-2012 Catalog)

Prerequisite(s): Admission to the ACCESS program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Undergraduate Special.
When Offered: Spring

PROV 110 - Special Topics

Credits: 1-3 (RT)
Exploration of leadership in a specific career field(s); changing nature of that industry; understanding of organizational structures in the field(s); and introduction to career and internship opportunities for students who aspire to a career in that field.

Equivalent to UNIV 110 (2011-2012 Catalog)

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Special Undergraduate.
When Offered: Summer

PROV 206 - Research Methods (CISA/Honors Peer Learning Partnership)

Credits: 0-1 (RD)
This course is an experiential credit course for Honors students partnering with ACCESS international students to develop
academic research skills.

Equivalent to UNIV 206 (2011-2012 Catalog)

**Prerequisite(s):** Completion of HNRS 110 with a grade of B+ or better and official offer from Center for International Student Access.

**Corequisite(s):** Enrollment as an Honor student in good standing

- **Hours of Lecture or Seminar per week:** 2-5
- **Hours of Lab or Studio per week:** 0
- **Grading:** Satisfactory/No Credit
- **When Offered:** Spring

**PROV 207 - Peer Educational Mentor Leadership**

Credits: 0-3 (RD)

This course is an experiential leadership course for students partnering with ACCESS international students as peer educational mentors.

**Prerequisite(s):** Sophomore status or higher.

**Corequisite(s):** Student in good standing.

- **Hours of Lecture or Seminar per week:** 3-5
- **Hours of Lab or Studio per week:** 0
- **Grading:** Satisfactory/No Credit
- **When Offered:** Fall, Spring

**PROV 342 - The George Mason Debates in Current Affairs**

Credits: 3 (RD)

In-depth investigation of one or more contemporary public policy issues. Examines the selected topics as discussed by scholars, public interest groups and think tanks, government officials, and the news media. Texts and guest lecturers presenting a wide range of perspectives are an important feature.

Fulfills general education requirement in synthesis.

Equivalent to UNIV 342 (2011-2012 Catalog)

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0

**PROV 501 - Graduate Studies Preparation for International Students I**

Credits: 2 or 3 (NR)

Designed especially for the Graduate BRIDGE program, this course is the first of a two-part transitional course series designed
for international students who are studying abroad, emphasizing development, readiness, and success for Graduate/Professional school enrollment. This first course covers western educational systems, university policies and procedures, writing skills and research resources, and graduate school study skills and methods.

Equivalent to UNIV 501 (2011-2012 Catalog)

Notes: This course is for graduate degree seeking students whose highest degree is from a non-US institution.
This course may not count towards academic degree requirements at the graduate level. Enrolled students are required to take UNIV 502 the following consecutive semester.

Hours of Lecture or Seminar per week: 2 or 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special.
When Offered: Fall

PROV 502 - Graduate Studies Preparation for International Students II

Credits: 2 or 3 (NR)
Designed especially for the Graduate BRIDGE program, this second of a two-part transitional course series is designed for international students who are studying abroad, emphasizing development, readiness, and success for Graduate school enrollment. This course covers postmodernism, cultural identity and assimilation/acculturation theory, advanced program development, university resources, research reading and methods, career planning as well as professional and personal presentation.

Equivalent to UNIV 502 (2011-2012 Catalog)

Prerequisite(s): Completion of UNIV 501 with a grade of B or better, in the immediate past semester.

Notes: This course is for graduate degree seeking students whose highest degree is from a non-US institution. This course may not count towards academic degree requirements at the graduate level.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
Grading: Graduate Special.
When Offered: Spring

PROV 503 - Interpersonal Communication for International Students: Practicum and Theory

Credits: 2 (NR)
Designed for the Graduate BRIDGE program, this course is tailored to international students who received their undergraduate degrees outside the United States. The course provides intensive practice in oral communication, with feedback on effective interpersonal interaction with faculty, graduate students, and undergraduates. Students use intensive practice in oral communication contexts typical at universities to build knowledge and skills for informal interpersonal communication settings with faculty, peers, and students as well as skills needed for formal presentations, class discussion, and tutoring. Readings cover research on first impression management; informative and explanatory communication; conveying emotional support, listening, and narrative skill. Assignments and exercises provide opportunities for feedback on intelligibility, intonation, syllable stress, vocabulary, syntax, and fluency, as well as pragmatic skills required for effective management of politeness norms, clear explanation of complexities, listening, class participation, tutoring, and provision of emotional support and humor in everyday
interaction.

Equivalent to UNIV 503 (2011-2012 Catalog)

**Prerequisite(s):** Completion of undergraduate degree at a university outside the United States.

**Corequisite(s):** Enrollment in a graduate degree-seeking program at Mason.

**Notes:** This course may not count towards academic degree requirements at the graduate level.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

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**PROV 505 - Special Topics in Advanced English for Academic Purposes**

Credits: 1-4 (RT)  
Designed for the Graduate BRIDGE program, this special topics course is tailored to international students who received their undergraduate degrees outside the United States. The course provides intensive practice and individualized feedback in advanced oral and/or written communication methods appropriate at the graduate level.

**Prerequisite(s):** PROV 501 and PROV 503.

**Notes:** This course may not count towards academic degree requirements at the graduate level.

**Hours of Lecture or Seminar per week:** 1-2  
**Hours of Lab or Studio per week:** 1-2  
**Grading:** Graduate Special.  
**When Offered:** Fall, Summer, Spring.

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**PROV 506 - Graduate Communication in the Disciplines I**

Credits: 3-4 (NR)  
Students develop strategies for completing research-based writing and presentations in their field. Students will review rhetorical structures and organizational strategies common to US academic scholarly communications generally and in their particular field. Students will also review and practice strategies at the sentence and discourse levels to increase the clarity, precision and appropriateness of their oral and written communication skills. Group instruction will be supplemented by one-on-one conferencing as students complete a major graduate-level project.

**Prerequisite(s):** Completion of undergraduate degree at a university outside the United States.

**Corequisite(s):** Enrollment in a graduate degree-seeking program at Mason.

**Notes:** This course may not count towards academic degree requirements at the graduate level without permission from the academic dean/director.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 1
Grading: Graduate Special.
When Offered: Fall, Spring.

PROV 507 - Graduate Communication in the Disciplines II

Credits: 3-4 (NR)
The second course in a series that helps students develop strategies for completing research-based writing and presentations in their field. Students will review rhetorical structures and organizational strategies common to US academic scholarly communications generally and in their particular field. Students will also review and practice strategies at the sentence and discourse levels to increase the clarity, precision and appropriateness of their oral and written communication skills. Group instruction will be supplemented by one-on-one conferencing as students complete a second major graduate-level project.

Prerequisite(s): Minimum grade of “B” in PROV 503.

Notes: This course may not count towards academic degree requirements at the graduate level without permission from the academic dean/director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
When Offered: Fall, Spring.

PROV 701 - Preparing for Academic Careers

Credits: 1 (NR)
This seminar will be devoted to helping doctoral students explore and prepare for future academic careers and to strengthening their instructional effectiveness. The seminar will provide a clearer understanding of the roles and responsibilities of being a faculty member. Participants will learn how to construct a meaningful statement of teaching philosophy and plan for a course through syllabus design.

Equivalent to UNIV 701 (2011-2012 Catalog)

Notes: This course does not apply to required credits for doctoral degrees.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall

Psychology (PSYC)

Offered by the College of Humanities and Social Sciences

PSYC 100 - Basic Concepts in Psychology
Credits: 3 (NR)
Introduces psychology as scientific discipline. Examines concepts and methods in learning, motivation, development, personality, and measurement.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 110 - Seminar in General Psychology**

Credits: 1 (NR)
Explores applications, implications, methods, and findings of psychology.

Corequisite(s): PSYC 100.

Notes: Students must be enrolled concurrently in PSYC 100. In-class work includes discussion that enriches the PSYC 100 lecture material, exploration of controversial issues in psychology, use of technology to broaden knowledge of psychology, and in-depth discussions of topics on which instructor has special expertise. Short papers are required.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

**PSYC 211 - Developmental Psychology**

Credits: 3 (NR)
Review of major developmental theories including perspectives of childhood, adolescence, adulthood, and old age.

Fulfills general education requirement in social and behavioral science.

Prerequisite(s): PSYC 100 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 231 - Social Psychology**

Credits: 3 (NR)
Study of human behavior development in a social matrix, including such topics as socialization, cultural behavior, group norms, and attitude formation.

Fulfills general education requirement in social and behavioral science.

Prerequisite(s): PSYC 100 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PSYC 260 - Basic Research Methods in Psychology

Credits: 1-3 (RT)
Introduction to research methods in psychology in the context of assisting faculty with research; individualized sections by arrangement with faculty. Methods taught vary but generally include basic data collection and recordkeeping methods in research.

Prerequisite(s): 6 credits of psychology or permission of instructor and department.

Notes: Course culminates in a paper describing techniques learned. No more than 6 credits in PSYC 260, 350, and 460 can be used toward a psychology major.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

PSYC 300 - Statistics in Psychology

Credits: 4 (NR)
Descriptive and inferential statistics in design, analysis, and interpretation of psychological research with practical application using computers in laboratory.

Fulfills general education requirement in information technology (all except ethics). PSYC 300, 301 and 372 must be taken in sequence.

Prerequisite(s): 6 credits of psychology and 3 credits of mathematics course work; or permission of instructor.

Notes: Students are strongly encouraged to take PSYC 301 concurrently.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

PSYC 301 - Research Methods in Psychology

Credits: 3 (NR)
General research design in psychology, with an emphasis on experimental design and control. Topics include use of human participants in research, reliability and validity, observational methods, and survey and longitudinal designs.

Fulfills general education requirement in information technology (all except ethics). PSYC 300, 301 and 372 must be taken in sequence.

Fulfills writing intensive requirement in the major.

Prerequisite(s): 6 credits of psychology, including PSYC 300 as prerequisite or corequisite, or permission of instructor.

Notes: Students are strongly encouraged to take PSYC 300 concurrently. Laboratory work will include designing and running research studies and writing manuscripts using appropriate style and format. PSYC 301 is a writing-intensive course.
Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 2

**PSYC 304 - Principles of Learning**

Credits: 4 (NR)
Principles of animal learning, including such topics as classical and operant conditioning, discrimination learning, and animal cognition.

Fulfills writing intensive requirement in the major.

Prerequisite(s): PSYC 300, or permission of instructor.

Notes: Laboratory projects require working with computer simulations. PSYC 304 is a writing-intensive course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

**PSYC 309 - Sensation, Perception, and Information Processing**

Credits: 4 (NR)
Principles of perception, including topics such as psychophysics, perceptual organization, perceptual learning, and perceptual constancies.

Fulfills writing intensive requirement in the major.

Prerequisite(s): PSYC 300 and PSYC 372, or permission of instructor.

Notes: Laboratory projects demonstrate and investigate perceptual phenomena. PSYC 309 is a writing-intensive course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

**PSYC 313 - Child Psychology**

Credits: 3 (NR)
Study of human psychological development from conception to adolescence including such topics as genetic factors, emotional and intellectual growth, and environmental influences.

Prerequisite(s): 6 credits of psychology or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 314 - Adolescent Psychology**
Study of the biological and cultural changes accompanying adolescence, including the effect of these changes on emotional, intellectual, and social development.

Prerequisite(s): 6 credits of psychology or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 317 - Cognitive Psychology

Credits: 3 (NR)
An in-depth overview of important topics in cognitive psychology, including memory, attention, pattern recognition, problem solving, reasoning, and psycholinguistics.

Prerequisite(s): 6 credits of psychology or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 320 - Psychological Tests and Measurements

Credits: 4 (NR)
Examination and application of principles underlying the theory, interpretation, and administration of psychological tests, including a study of tests of intelligence, achievement, and ability.

Prerequisite(s): PSYC 300, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

PSYC 321 - Counseling Psychology

Credits: 3 (NR)
Review of the theories and methods in psychological counseling.

Prerequisite(s): PSYC 325 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 322 - Behavior Modification
Examination of experimental principles of human and animal learning within theoretical framework of applied behavior analysis, including design, implementation, and evaluation of operant intervention programs across a wide variety of human situations.

Prerequisite(s): PSYC 324 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 323 - Clinical and Social Psychology Research Techniques**

Credits: 4 (NR)
Review and application of research techniques including interviewing, survey analysis, and process analysis. PSYC 323 is a writing-intensive course.

Prerequisite(s): PSYC 300, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

**PSYC 324 - Personality Theory**

Credits: 3 (NR)
Introduction to classical and contemporary theories of personality, and comparative evaluation of major theories in terms of relevant studies.

Prerequisite(s): PSYC 100 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 325 - Abnormal Psychology**

Credits: 3 (NR)
Study of development of abnormal behavior patterns, including such topics as methods of diagnosis and prevention of serious mental disorders such as psychosomatic disorders, psychoses, character disorders, and mental retardation.

Prerequisite(s): PSYC 100, and one of PSYC 211, 231, or 324; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 326 - Therapeutic Communication Skills**
Credits: 3 (NR)
Introduction to understanding and use of basic therapeutic communication skills used in clinical and counseling psychology.

Prerequisite(s): PSYC 325 or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 327 - Psychology in the Community

Credits: 3 (RD)
Individual placements in applied psychology settings.

Prerequisite(s): Psychology major with minimum 6 psychology credits, and permission of associate chair for undergraduate studies.

Notes: May be repeated for a maximum of 6 credits. A maximum of 6 credits of PSYC 327, 328, 421, and 422 can be applied to the psychology major.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 328 - Psychology in the Community Laboratory

Credits: 1 (RD)
Consists of a one-hour service learning component linked to selected psychology courses.

Prerequisite(s): Psychology major with minimum 6 psychology credits and permission of course instructor and associate chair for undergraduate studies.

Corequisite(s): Enrollment in psychology course for which this is service learning component.

Notes: May be repeated for a maximum of 6 credits. A maximum of 6 credits of PSYC 327, 328, 421, and 422 can be applied to the psychology major.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

PSYC 330 - Psychology of Adjustment

Credits: 3 (NR)
Nature of effective and faulty patterns of adjustment. Factors in healthy and unhealthy personality development, unique motivation patterns of individuals, and influence of personally significant groups on adjustment. Resources for personal growth and application of contemporary psychological principles to achievement of increased intellectual, emotional, and social competence.

Prerequisite(s): PSYC 100 or permission of instructor.
Notes: PSYC 330 cannot be taken for credit by psychology majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 333 - Industrial and Organizational Psychology

Credits: 3 (NR)
Examination of application of psychological principles and methods to problems commonly encountered in business and industry.

Prerequisite(s): PSYC 100 and 300; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 335 - Psychology of Creativity and Innovation

Credits: 3 (NR)
Creativity and innovation take place in many domains such as business, science and the arts. Learn the distinction between creativity and innovation. Apply findings from the scientific literature about the antecedents of creativity and innovation including emotions, cognition, individual differences, and social contexts. Experiment with ways to enhance your creativity and skills for innovation.

Prerequisite(s): PSYC 100 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

PSYC 350 - Directed Reading and Research in Psychology

Credits: 1-3 (RT)
Library research in psychology, culminating in a substantial formal paper; individualized sections by arrangement with faculty.

Prerequisite(s): PSYC 100 and 300, and permission of instructor and department.

Notes: No more than 6 credits in PSYC 260, 350, and 460 can be used toward psychology major.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

PSYC 362 - Psychology of Women
Behavior and attitudes of women; influence of chromosomes and hormones on behavior, influence of culture on sex role differentiation, and theories of sex role development.

**Prerequisite(s):** PSYC 100 and BIOL 103, 104; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PSYC 372 - Physiological Psychology**

Credits: 3 (NR)  
Survey of neuroscience, including basic neuroanatomy, neural and synaptic transmission, neural mechanisms underlying normal and abnormal behavior, and biological mechanisms of drug action.

Fulfills general education requirement in information technology (all except ethics). PSYC 300, 301 and 372 must be taken in sequence.

**Prerequisite(s):** PSYC 100, and BIOL 103 and 104; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PSYC 373 - Physiological Psychology Laboratory**

Credits: 1 (NR)  
Functional anatomy and physiology of the brain, including dissection of brain and eye, and a demonstration and practice in research methods for studying physiological mechanisms underlying behavior.

**Prerequisite(s):** PSYC 372 or 375 or permission of instructor

**Corequisite(s):** PSYC 372 or 375 or permission of instructor

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 2

**PSYC 375 - Brain and Behavior I**

Credits: 3 (NR)  
First half of comprehensive survey of neuroscience, including basic neuroanatomy, neural and synaptic transmission, neural mechanisms underlying normal and abnormal behavior, and biological mechanisms of drug action.

**Prerequisite(s):** PSYC 100, and BIOL 103, 104; or permission of instructor.

**Notes:** Students may earn credit for 372 and either 375 or 376, but they may not earn credit for all three.
PSYC 376 - Brain and Behavior II

Credits: 3 (NR)
Second half of comprehensive survey of neuroscience, including basic neuroanatomy, neural and synaptic transmission, neural mechanisms underlying normal and abnormal behavior, and biological mechanisms of drug action.

Prerequisite(s): PSYC 100, and BIOL 103, 104; or permission of instructor.

Notes: Students may earn credit for 372 and either 375 or 376, but they may not earn credit for all three.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 379 - Applied Cross-Cultural Psychology

Credits: 3 (NR)
A review of important landmarks in cross-cultural research, showing how this research impacts psychology as a discipline. Emphasizes an empirical approach to cross-cultural study and includes topics such as theoretical and empirical developments in cross-cultural psychology, development of coherent schema's to guide cross-cultural research and interventions, comparison of psychology's goals and assumptions in Western and other cultures, and integration of course materials into educational and career goals of students.

Fulfills general education requirement in global understanding.

Prerequisite(s): PSYC 100, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 399 - Professional Issues in the Social Sciences: From College to Career

Credits: 2 (NR)
Emphasizes development and readiness for a profession in the social sciences through self-assessment and professional skill acquisition.

Prerequisite(s): At least 30 hours of completed college coursework and a declared major in the social sciences or permission of the instructor.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PSYC 405 - Mystery, Madness, and Murder
Multidisciplinary approach to taboo topics that fascinate and frighten us. Instructors from disciplines across the arts and sciences bring expertise and diverse perspectives to provocative issues such as cannibalism and serial murder. Students learn to think critically and objectively while examining use in myth, literature, and popular culture.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

PSYC 406 - Psychology of Communication

Credits: 3 (NR)
An examination of the behavior of communicating across species and sensory modalities, with an emphasis on the evolutionary basis for the various communication strategies used by animals and humans.

Fulfills general education requirement in synthesis.

Prerequisite(s): PSYC 100 or permission of instructor and completion or current enrollment in all general education requirements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 414 - Behavior Disorders of Childhood

Credits: 3 (NR)
Review of the theories, methods, and research dealing with emotional and behavioral disorders of children.

Prerequisite(s): PSYC 313 and 325, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 415 - Psychological Factors in Aging

Credits: 3 (NR)
Examination of the sensory, perceptual, intellectual, and personality changes that occur in older people. Common adjustment problems as well as more serious adjustment difficulties are discussed. Applications of various personality theories of aging.

Prerequisite(s): PSYC 100 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PSYC 417 - Science of Well Being

Credits: 3 (NR)
This course will examine and interpret the latest research in social, personality, and clinical psychology on well-being, character strengths, and personal growth. Emphasis will be placed on the ways in which scientists generate hypotheses regarding the nature of positive psychological traits and processes and the methods by which these ideas are tested.

Prerequisite(s): PSYC 100 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

PSYC 418 - Death, Dying, and Grieving

Credits: 3 (NR)
Advanced survey of processes of grieving and their relationship to death and dying. Topics include ways of dying, effects of death on loved ones, and care for the terminally ill.

Prerequisite(s): PSYC 100 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 419 - Synthesis in Psychology

Credits: 3 (RD)
Understand and relate broad psychological issues to society as a whole. Possible topics include mental health in society, the psychology of food and eating behavior, and animals and society. See schedule of classes for current topic(s).

Prerequisite(s): PSYC 100 or permission of instructor.

Notes: May be repeated for a maximum of 15 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 421 - Undergraduate Practicum in Psychology

Credits: 3 (NR)
Supervised experience in application of psychological principles requiring work in a nonclassroom situation.

Prerequisite(s): PSYC 325 and 326, and permission of Clinical Review Committee.
Notes: A maximum of 6 credits of PSYC 327, 328, 421, and 422 can be applied to the psychology major.

**PSYC 422 - Undergraduate Practicum in Psychology**

Credits: 3 (NR)
Supervised experience in application of psychological principles requiring work in a nonclassroom situation.

Prerequisite(s): PSYC 325 and 326, and permission of Clinical Review Committee.

Notes: A maximum of 6 credits of PSYC 327, 328, 421, and 422 can be applied to the psychology major.

**PSYC 423 - Group Psychotherapy Techniques**

Credits: 3 (NR)
Review of theory and methods of group therapy with emphasis on humanistic and interpersonal approaches, including applications to family therapy, alcoholism, and drug abuse.

Prerequisite(s): PSYC 324 or permission of instructor.

**PSYC 427 - Community Engagement for Social Change**

Credits: 3 (NR)
Explores social problems and interpersonal, intrapersonal, and social aspects of addressing them. Addresses both theoretical aspects of social problems through readings and class discussion and application through community service.

Fulfills general education requirement in Synthesis.

Prerequisite(s): PSYC 100 or permission of instructor.

**PSYC 435 - Personnel Training and Development: A Psychological Perspective**
Overview and critique of training methods used in industry from viewpoint of psychological theory, including simulations, on-the-job training, supervisory/leadership skills training, computer-assisted instruction, and programmed texts. Principles of needs analysis, program development, and program evaluation are discussed within framework of industrial psychology.

**Prerequisite(s):** PSYC 333, PSYC 320, or permission of instructor

**Corequisite(s):** PSYC 320 or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PSYC 460 - Independent Study in Psychology**

Credits: 1-4 (RT)  
Advanced research methods in psychology in context of individual student projects or assisting with research on faculty projects; individual sections by arrangement with faculty.

**Prerequisite(s):** 18 credits of psychology including PSYC 301, with grade of C or better; 2.50 GPA in psychology; and written proposal approved before registration by instructor and department.

**Notes:** No more than 6 credits in PSYC 260, 350, and 460 can be used toward psychology major.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0

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**PSYC 461 - Special Topics**

Credits: 1-3 (RT)  
Selected topics reflecting interest in specialized areas.

**Prerequisite(s):** See course description in Schedule of Classes.

**Notes:** Topic announced in advance. May be repeated for credits when topic is different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PSYC 465 - History and Systems in Psychology**

Credits: 3 (NR)  
Historical background and major theoretical systems in modern psychology. Approaches include behaviorism, cognitive/information processing approaches, and psychodynamic theories.

**Prerequisite(s):** 18 credits in psychology including PSYC 317, or permission of instructor
PSYC 466 - Psychology of Intimate Relationships

Credits: 3 (NR)
Advanced survey of theories and research related to intimate relationships, including romantic relationships and those among family members and friends.

Prerequisite(s): PSYC 100 and 231; PSYC 324 recommended; or permission of instructor.

PSYC 467 - The Psychology of Working in Groups and Teams

Credits: 3 (NR)
Teaches knowledge and the skills to meet communication, interpersonal, and task-related challenges that arise when functioning in work teams. Through readings, classroom activities, and applied problem-solving exercises, students acquire or refine team-related competencies. Students study theory of group and team processes while gaining insight from feedback on their behavior in exercises to become more effective team members.

Prerequisite(s): 60 credits including PSYC 100, or permission of instructor.

PSYC 472 - Advanced Physiological Psychology

Credits: 3 (RT)
Rotating topics. Physiological mechanisms underlying behavior. Selected topics include neuronal bases of learning and memory, and biological bases of reinforcement and addiction.

Prerequisite(s): PSYC 372 or 375 and 376; or permission of instructor.

Notes: May be repeated for a maximum of 6 credits with approval of instructor.

PSYC 490 - Psychology Honors I

Credits: 3 (NR)
Review of topics and issues in psychology, including historical overview, theory and supporting data, and influences on behavior.
**Prerequisite(s):** Admission to Psychology Department honors status.

**Notes:** Topics vary. May not be repeated.

**Hours of Lecture or Seminar per week:** 3-6  
**Hours of Lab or Studio per week:** 0

**PSYC 491 - Psychology Honors II**

Credits: 3 (NR)  
Introduces advanced statistics, research methodologies, statistics packages, computing and information technology, and library technology appropriate for psychological research and pedagogy.

**Prerequisite(s):** PSYC 300, 301, and 490.

**Notes:** Students required to complete proposal in preparation for admission to Psychology Honors III. May not be repeated.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PSYC 492 - Psychology Honors III**

Credits: 3 (NR)  
Completion of final honors project or thesis. Students must complete project or thesis, and present oral defense to committee and poster to class. Students also expected to prepare proposal to present project or thesis at regional or national conference, or prepare manuscript for publication in appropriate journal.

**Prerequisite(s):** PSYC 491, and approval of proposal for final honors project or thesis.

**Notes:** May not be repeated.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PSYC 499 - Senior Thesis**

Credits: 3 (NR)  
Directed research on topic agreed on by student and advisor.

**Prerequisite(s):** Psychology major with 90 credits, experimental psychology lab course, 3.00 GPA in psychology, PSYC 460, permission of instructor, and prior approval of thesis proposal.

**Notes:** Students should take PSYC 460 with same advisor to develop thesis proposal before registering for PSYC 499. Students must complete thesis and defend it orally before advisor and two faculty members. With permission of department, students may take a second semester for maximum 6 credits.
PSYC 506 - Theories of Personality

Credits: 3 (NR)
Comparative review of prevalent theories of personality with special emphasis on fundamental models, and similarities and differences.

Prerequisite(s): PSYC 324 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 518 - Death, Dying, and Grieving

Credits: 3 (NR)
Advanced survey of processes of grieving and their relationship to death and dying. Topics include ways of dying, effects of death on loved ones, and care for the terminally ill.

Prerequisite(s): PSYC 100

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 527 - Introduction to Neurobiology

Credits: 2 (NR)
Introduction to neurobiology with overview of embryological development of nervous system in evolutionary context. Introduces regional and systems neuroanatomy by studying mammalian visual system with comparative perspective.

Prerequisite(s): PSYC 372 or PSYC 375 and 376, or BIOL 213 and 303.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

PSYC 530 - Cognitive Engineering: Cognitive Science Applied to Human Factors

Credits: 3 (NR)
Application of cognitive theory to understand and predict interactions among human cognition, artifact, and task. Discusses recent research and case studies that emphasize empirical research, analytical modeling techniques, systems design, and development of tools and methods.

Prerequisite(s): Experimental lab course, or permission of instructor.
PSYC 531 - Mammalian Neurobiology

Credits: 3 (NR)
Functional anatomy of brains of mammals, with emphasis on regional and systems neuroanatomy of humans. Anatomy correlated with material from clinical neurology where possible. Laboratory component includes brain dissections and clinical correlations.

Prerequisite(s): PSYC 527.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 3

PSYC 541 - Survey Research

Credits: 3 (NR)
Introduces theory, method, and practice of survey research; students complete survey research project.

Prerequisite(s): PSYC 300, SOCI 221, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 552 - Histology/Histochemistry of the Brain

Credits: 5 (NR)
Explores conceptual basics and provides hands-on experience in techniques for studying brain tissue, including stereotaxic surgery, perfusion, sectioning, Nissl and myelin stains, enzyme histochemistry, immunohistochemistry, in situ hybridization, and quantitative receptor autoradiography.

Prerequisite(s): PSYC 372 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

PSYC 555 - Neuroimaging

Credits: 3 (NR)
Covers functional magnetic resonance imaging (fMRI) methods, experimental design and analysis issues in fMRI, structural MRI techniques and how they can contribute to cognitive neuroscience, and event-related potential methods.

Prerequisite(s): Graduate enrollment in either Cognitive & Behavioral Neuroscience or Human Factors & Applied Cognition
programs, or instructor approval.

**PSYC 556 - Chemistry and the Brain**

Credits: 3 (NR)
Fundamentals of general chemistry, atoms, molecules, and reactions, with emphasis on water solutions. Organic compounds and functional groups, biosynthesis and properties, and examples from nervous system. Also includes biopolymers and their roles in cellular and neuronal organization, ionic channels, neurotransmitter receptors, and psychoactive substances.

**Prerequisite(s):** PSYC 372 or 375 and 376; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PSYC 557 - Psychometric Methods**

Credits: 3 (NR)
Examines concepts of psychological measurement with emphasis on predictor test and criterion development. Discusses reliability, validity, and specialized techniques to develop tests of ability, interest, and personality.

**Prerequisite(s):** PSYC 611 and 612, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PSYC 558 - Neuronal Bases of Learning and Memory**

Credits: 3 (NR)
Examines neuronal mechanisms involved in learning and memory, in animals ranging from invertebrates to humans.

**Prerequisite(s):** PSYC 372 or 375 and 376; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PSYC 559 - Behavioral Chemistry**

Credits: 3 (NR)
Neurochemistry and neuroendocrinology, including neurotransmitter synthesis, genetic aspects of neural functioning, mechanisms of action of neurotransmitters and second messenger systems, regulation of neuroendocrine systems, neuroendocrine
effects on behavior, and neuroimmunology.

Prerequisite(s): PSYC 372 or 375 and 376; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 560 - Advanced Applied Social Psychology**

Credits: 3 (NR)
Study of major trends in social psychological research with emphasis on ethical and practical problems posed by human experimentation. Topics include attitude measurement and change, conformity, social perception, and small group interaction.

Prerequisite(s): PSYC 231.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 561 - Behavioral Biology of Substance Abuse**

Credits: 3 (NR)
Overview of biological effects of substance abuse, and biological mechanisms underlying addiction. Topics include alcohol, cocaine, marijuana, and other drugs; genetics of addiction; and neural systems underlying addiction and withdrawal.

Prerequisite(s): PSYC 372 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 592 - Special Topics**

Credits: 1-6 (RT)
Special topics reflecting interests in specialized areas.

Notes: Topic announced in advance. May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 597 - Directed Reading and Research**

Credits: 1-6 (RT)
Independent reading or research on topic agreed on by student and faculty member.
Prerequisite(s): Permission of instructor.

Notes: Directed reading or research for MA students in psychology. May be repeated within the same term or a different term for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**PSYC 611 - Advanced Statistics**

Credits: 4 (NR)
Test must be passed to take course. Open only to degree students. Integrates basic psychological statistics with overview of research methodology including experimental, quasi-experimental, field approaches, and measurement issues from advanced perspective. Lab work includes using computer packages for data handling and analyses.

Prerequisite(s): Screening test given on first evening of class

Notes: Students must enroll in 611 and 612 in sequential semesters.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2
Grading: Graduate Special

**PSYC 612 - Advanced Statistics**

Credits: 4 (NR)
Open only to degree students. Integrates basic psychological statistics with overview of research methodology including experimental, quasi-experimental, field approaches, and measurement issues from advanced perspective. Lab work includes use of computer packages for data handling and analyses.

Prerequisite(s): Grade of A or B in PSYC 611.

Notes: Students must enroll in 611 and 612 in sequential semesters.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

**PSYC 614 - The Psychology of Aging**

Credits: 3 (NR)
Review of the experimental literature in psychology of aging, including intellectual functioning, personality and adjustment, minor and major adjustment problems, and role changes in later life.

Prerequisite(s): PSYC 100 and undergraduate or graduate course in aging.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**PSYC 615 - Language Development**

Credits: 3 (NR)
Seminar covering theory and research on acquisition of language, including biological and environmental influences and constraints; research methods; role of parents; individual and cultural differences; links between language and other domains of development including cognitive, behavioral, social, and emotional; language and the brain; animal language; bilingualism; and atypical language development.

**Prerequisite(s):** 3 credits of graduate development psychology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PSYC 617 - Child Psychopathology**

Credits: 3 (NR)
Intensive survey of major types of psychopathological disturbances of infancy and childhood.

**Prerequisite(s):** PSYC 313 or 211, and 325.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PSYC 619 - Applied Behavior Analysis: Principles, Procedures, and Philosophy**

Credits: 3 (NR)
Focuses on basic principles and procedures of applied behavior analysis; identification of factors that contribute to behavioral problems and improved performance; and procedures that can be used to minimize behavioral problems, improve performance, teach new behaviors, and increase probability of behaviors occurring under appropriate circumstances.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PSYC 621 - Applied Behavior Analysis: Empirical Bases**

Credits: 3 (NR)
Focuses on basic content of applied behavior analysis, and teaches how to implement behavioral procedures and develop behavioral programs for clients with fundamental behavioral needs.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
PSYC 623 - Applied Behavior Analysis: Assessments and Interventions

Credits: 3 (NR)
Further expands on basic content of applied behavior analysis, and teaches how to implement behavioral procedures and develop behavioral programs for clients with fundamental behavioral needs.

Prerequisite(s): PSYC 619 and 621, or EDSE 619 and 621.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 624 - Applied Behavior Analysis: Applications

Credits: 3 (NR)
Expands capability to deal with more complex behavioral situations, enabling ability to relate to more sophisticated professional issues and environments.

Prerequisite(s): PSYC 619 and 621, or EDSE 619 and 621.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 625 - Applied Behavior Analysis: Verbal Behavior

Credits: 3 (NR)
Further expands capability to deal with more complex behavioral situations, enabling ability to relate to more sophisticated professional issues and environments.

Prerequisite(s): PSYC 619 and 621, or EDSE 619 and 621.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 630 - Developmental Disabilities

Credits: 3 (NR)
Lectures, seminars discuss state-of-the-art and evidence-based information about developmental disabilities across life span with emphasis on mental retardation. Includes epidemiology, etiology, diagnoses, risk factors, treatment, supports, and prevention of developmental disabilities. Pertinent philosophical, ethical, and legal issues concerning this special-needs population will be discussed.

Prerequisite(s): 3 credits of graduate developmental psychology courses, or permission of instructor

Notes: In addition to course work and assigned reading, students sign up for a 20-hour per semester practicum.
PSYC 631 - Industrial and Personnel Testing and Evaluation

Credits: 3 (NR)
Study of administration, scoring, and interpretation of standard tests used by industry for selection and assessment of personnel.

Prerequisite(s): PSYC 300 and 320.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 633 - Evaluative Research in Psychology

Credits: 3 (NR)
Examines research techniques specifically designed to evaluate human effectiveness of organizations and mental health programs.

Prerequisite(s): PSYC 300 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 636 - Survey of Industrial Psychology

Credits: 3 (NR)
Intensive survey of historical and current issues in major areas of applied (nonclinical) psychology.

Prerequisite(s): PSYC 300 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 638 - Training: Psychological Contributions to Theory, Design, and Evaluation

Credits: 3 (NR)
Focuses on applying learning principles derived from psychological research in development of training models and techniques of skill acquisition. Discusses research designs and empirical results appropriate to training evaluation.

Prerequisite(s): PSYC 636, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**PSYC 639 - Survey of Organizational Processes**

Credits: 3 (NR)
Trains at conceptual/theoretical and empirical levels in organizational processes. Includes individual, interpersonal, intra-group, and intergroup phenomena as they exist in context of organizational settings.

**Prerequisite(s):** PSYC 333 or 632.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PSYC 640 - Techniques in Industrial/Organizational Psychology**

Credits: 3 (NR)
Skills-oriented course enabling students to construct instruments and perform functions critical to both researchers and practitioners in industrial/organizational psychology. Focuses on conducting job analysis interviews, developing and scoring task inventories, using critical incident and KSAO methods, and constructing performance appraisal and selection instruments.

**Prerequisite(s):** PSYC 300, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PSYC 644 - Methods for Social Research**

Credits: 3 (NR)
Examines issues in basic and applied social science methodology including internal validity, causal generalization, and construct validity.

**Prerequisite(s):** Permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PSYC 645 - Research Methods in Human Factors and Applied Cognition**

Credits: 3 (NR)
Hands-on approach to selected current or classical human factors/applied cognition research methods; exact methods announced in advance. Potential methods include cognitive task analysis, usability evaluation methods, critical incident analysis, reliability analysis, workload measures, verbal protocol analysis, and engineering models of human performance.

**Prerequisite(s):** PSYC 530 and 611.

**Notes:** May be repeated for credit.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 646 - Issues and Methods in Longitudinal Developmental Research

Credits: 3 (NR)
Examines techniques for measuring developmental change across lifespan.

Prerequisite(s): PSYC 611 and 612, and 6 credits of graduate developmental psychology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 648 - Developmental Psychopathology

Credits: 3 (NR)
In-depth look at emerging discipline of developmental psychopathology. Discusses specific disorders and contexts to illustrate how knowledge of normal development, deviant development, and maladaptive behavior illuminates principles underlying adaptive functioning.

Prerequisite(s): 6 credits of graduate developmental psychology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 652 - Quantitative Methods II: Analysis of Variance

Credits: 3 (NR)
Basic concepts in experimental design, fundamental assumptions in analysis of variance, and analysis of variance and covariance designs. Reviews multiple comparison tests.

Prerequisite(s): PSYC 300 and either 304, 305, or 309.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 654 - Naturalistic Methods in Psychology

Credits: 3 (NR)
Theory and techniques involved in studying people in their natural environment. Primary emphasis on quasiexperimental designs and methods of systematic observation.

Prerequisite(s): PSYC 300 and either 304, 305, or 309.
PSYC 666 - Cognitive and Perceptual Development

Credits: 3 (NR)
Survey of theory and research on development of perception, memory, concepts, problem solving, intelligence, and academic skills in children.

Prerequisite(s): 6 credits of child psychology and course in experimental psychology or permission of instructor.

PSYC 667 - Behavior in Small Groups and Teams

Credits: 3 (NR)
Theories, methods, and topics relevant to individual behavior in small group setting. Includes effects of individual on group, effects of group on individual, and interaction effects among individuals.

Prerequisite(s): PSYC 231.

PSYC 668 - Personality: Theoretical and Empirical Approaches

Credits: 3 (NR)
Presents comprehensive overview of current theoretical and empirical approaches to personality. Emphasizes areas of special relevance to clinical, developmental, and industrial/organizational psychology.

Prerequisite(s): PSYC 324, or permission of instructor.

PSYC 669 - Social and Emotional Development

Credits: 3 (NR)
Surveys theory and research relevant to development of social relationships, emotional expressiveness and regulation, aggressive and altruistic behaviors, sex roles, and morality. Emphasizes influences on such development, including parents, other adults, peers, siblings, and broader culture.
Prerequisite(s): 6 credits of developmental psychology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 671 - Role and Function of the School Psychologist

Credits: 3 (NR)
Considers roles, functions of school psychologist in educational environment, including certification and ethical standards, issues, and trends.

Notes: Open only to school psychology MA students, or by permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 673 - Prevention, Intervention, and Consultation in Schools

Credits: 4 (NR)
Examines theory and practice of behavior modification and consultation in school environment.

Notes: Open to practicing school psychologists and students in school psychology, or by permission of instructor.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

PSYC 678 - Topics in School Psychology

Credits: 1-6 (RT)
Selected topics reflecting specialized area of school psychology.

Notes: Open to practicing school psychologists and advanced students in school psychology, or by permission of instructor. Content varies. May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 684 - Psychological Counseling Techniques

Credits: 3 (NR)
Students gain experience in counseling techniques used in schools and contemporary practice.

Notes: Open to practicing school psychologists or psychology graduate students with prior course in counseling. Application of various counseling approaches and techniques to school-age child and adolescent.
PSYC 685 - Cognitive Neuroscience

Credits: 3 (NR)
Provides an overview of the neural basis of human mental functions. Uses neuroimaging (PET, fMRI, ERPs, TMS, etc.), computational, and information-processing methods to examine functions such as attention, memory, language, emotion, and decision making.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 701 - Cognitive Bases of Behavior

Credits: 3 (NR)
Surveys concepts in learning, cognitive, and affective processes, including theories and supporting data and their influences on behavior.

Prerequisite(s): Admission to graduate program in psychology.

Notes: Open only to degree students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 702 - Biological Bases of Human Behavior

Credits: 3 (NR)
Surveys biological bases of behavior, including such topics as neural conduction, role of specific neurotransmitters, cortical functioning, and brain disorders.

Notes: Open only to degree students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 703 - Social Bases of Behavior

Credits: 3 (NR)
Surveys social influences on behavior, including group processes, person perception, and attitude formation.

Prerequisite(s): Admission to graduate program in psychology.
Notes: Open only to degree students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 704 - Life-Span Development**

Credits: 3 (NR)
Surveys theories and research regarding lifespan development and personality formation.

Prerequisite(s): Admission to graduate program in psychology.

Notes: Open only to degree students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 705 - Historical and Philosophical Issues in Psychology**

Credits: 3 (NR)
Important historical and systematic approaches to psychology and their relationship to the philosophy of science, structure of theory, and philosophical issues in psychology.

Prerequisite(s): Admission to graduate program in psychology.

Notes: Open only to degree students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 709 - The Measurement of Intelligence**

Credits: 4 (NR)
Administration, scoring, and interpretation of major infant, child, and adult intelligence tests, with emphasis on individual tests. Development of IQ tests, theories of intelligence, and current trends and developments in intellectual assessment.

Prerequisite(s): PSYC 617 or 822 and PSYC 320 or equivalent; permission of department. Coreq: PSYC 611.

Corequisite(s): PSYC 611.

Notes: Open only to school psychology MA student.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2
PSYC 710 - Psychological Assessment

Credits: 4 (NR)
Study of major instruments used in clinical assessment and nature, problems, and predictive value; administration and scoring of major techniques for evaluation of personality; and principles of interpretation of these procedures.

Prerequisite(s): PSYC 617, 709, 822, or 810; and permission of director of School Psychology Program.

Notes: Open only to school psychology MA students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

PSYC 722 - Advanced Child Assessment

Credits: 4 (NR)
Problems involved in diagnostic assessment of children with various handicapping conditions such as learning disabilities, retardation, and emotional disturbances.

Prerequisite(s): PSYC 709 and 710 or PSYC 810 and 811, five intellectual assessments at psychological clinic, and permission of department.

Notes: Open only to school psychology MA or PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

PSYC 730 - Practicum in Applied Psychology

Credits: 1-6 (RD)
Practical experience in organizational setting as assigned.

Prerequisite(s): Admission to graduate program in psychology and permission of department.

Notes: PhD students may repeat course for a maximum of 15 credits; MA students for a maximum 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

PSYC 733 - Issues in Personnel Psychology

Credits: 3 (NR)
Examines psychological literature on job analysis, job evaluation and compensation, performance appraisal, training, and EEOL selection issues. Methodological and psychometric issues in interpretation and evaluation of personnel psychology research receive particular attention.
Prerequisite(s): PSYC 636 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 734 - Seminar in Human Factors and Applied Cognition

Credits: 3 (RT)
Emphasizes current research and application of human factors, ergonomics, applied cognition, and applied perception.

Prerequisite(s): 6 graduate credits in human factors and applied cognition, or permission of instructor.

Notes: May be repeated for a maximum of 9 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 735 - Psychological Perspectives on Organizational Development

Credits: 3 (NR)
Theories and methods in industrial/organizational psychology as they relate to organizational change and development. Actual training in organizational diagnosis, change through supervised field work.

Prerequisite(s): 3 graduate credits in industrial/organizational psychology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 736 - Research in Human Performance Assessment

Credits: 3 (NR)

Prerequisite(s): 3 graduate credits in industrial/organizational psychology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 737 - Psychology of Human-Technology Interaction
PSYC 739 - Seminar in Industrial/Organizational Psychology

Credits: 3 (RD)
Rotating topics such as leadership theories and management development, and performance appraisal.

Prerequisite(s): PSYC 333 and 636, or permission of instructor.

Notes: Topics announced in advance. May be repeated for a maximum of 12 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 741 - Psychology of Work Motivation

Credits: 3 (NR)
Examines psychological literature of need, cognitive, and reinforcement theories of motivation; organizational attachment (commitment, absenteeism, and turnover); job design and quality of work issues. Emphasizes methodological and psychometric issues in interpreting and evaluating work-motivation research.

Prerequisite(s): PSYC 333 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 750 - School Psychology Practicum I

Credits: 1 (NR)
Practical experience in school psychology.

Prerequisite(s): Admission to school psychology concentration and PSYC 709.

Notes: Open only to school psychology MA students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
PSYC 751 - School Psychology Assessment Practicum II

Credits: 2 (RD)
Practical experience in school psychology.

Prerequisite(s): PSYC 750.

Notes: Open only to School Psychology MA students. Apply in writing for permission of department 60 days prior to beginning of semester. May be repeated for a maximum of 4 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 754 - Quantitative Methods III: Psychological Applications of Regression Techniques

Credits: 3 (NR)
Reviews psychological applications of regression techniques in variety of contexts including experimental, field, and survey settings.

Prerequisite(s): PSYC 611 and 612.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 756 - Quantitative Methods IV: Multivariate Techniques in Psychology

Credits: 3 (NR)
Surveys multivariate statistical techniques as applied to psychological research. Emphasizes analysis of complex designs and interpretation of multivariate data analyses resulting from computer processing.

Prerequisite(s): PSYC 611 and 612, or equivalent; PSYC 755 recommended.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 757 - Advanced Topics in Statistical Analysis

Credits: 3 (RD)
Focuses on noncognitive individual differences that predict performance. Published work discussed in seminar format with emphasis on conceptual development, methodological adequacy, and new directions.

Prerequisite(s): PSYC 754.
Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 758 - Dispositional Predictors of Performance**

Credits: 3 (NR)
Focuses on individual differences other than cognitive ability that predict performance. Papers discussed in seminar format with eye toward conceptual development and empirical review.

Prerequisite(s): PSYC 636.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 759 - Applied Decision Making**

Credits: 3 (NR)
Covers "basic applied" decision-making research. First half of course reviews basic psychological research on judgment and decision making; second half applies research to various practical problems. Overarching goal is to understand how basic decision-making literature can better inform applied research and practice.

Prerequisite(s): PSYC 611/612

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 768 - Advanced Topics in Cognitive Science**

Credits: 3 (RT)
Emphasizes current research in cognitive science. Topics may include computational cognitive models, nature of expertise, diagrammatic reasoning, display-based problem solving, visual attention, decision making, goal-based versus event-based cognition, and situated action.

Prerequisite(s): PSYC 530 or 701.

Notes: May be repeated for a maximum of 12 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 780 - Applied Developmental Psychology**
PSYC 786 - Assessment and Treatment in Gerontology

Credits: 3 (NR)
Functional assessment of older adults including conceptual and methodological problems involved. Examines intervention strategies with older adults, including interviewing, group work with older persons, milieu therapy, reality therapy, and design of supportive environments.

Prerequisite(s): Course in the psychology of aging, PSYC 320 and 423, or equivalent courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 790 - School Psychology Internship

Credits: 3-6 (RD)
Supervised field experience of one school year. Advanced school psychology student functions as full-time staff member in school system. Student completes paper on practical research project involving alternative school psychology role in school system.

Prerequisite(s): Completion of required courses in school psychology and permission of program coordinator.

Notes: Enrollment is for total 9 credits (thesis option) or 12 credits (nonthesis option) in increments of 3 credits according to placement. Students enrolled in PSYC 799 are not required to complete the practical research project.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

PSYC 792 - Practicum in Developmental Psychology, Biopsychology, and School Psychology

Credits: 1-6 (RD)
Supervised experience in developmental psychology, biopsychology, or school psychology.

Prerequisite(s): Admission to concentrations in developmental psychology, biopsychology, or school psychology; 3 credits of graduate developmental psychology, biopsychology, or advanced standing in school psychology.
Notes: Interested students must apply to area coordinator 60 days before registration. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: S/NC

PSYC 794 - Developmental Assessment

Credits: 1-6 (RT)
Introduces considerations and methods needed for evaluating young children (ages two - six). Focus on the skills necessary for formulating, conducting, and reporting comprehensive developmental evaluations. Emphasizes evaluation of preschool children and includes information relating to infants, as well as older children functioning at lower developmental levels.

Prerequisite(s): Admission to applied developmental psychology program.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

PSYC 798 - Thesis Proposal

Credits: 1-6 (RD)
Work on a proposal for master's thesis.

Prerequisite(s): Permission of program coordinator.

Notes: May not be repeated for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: S/NC

PSYC 799 - Master's Thesis

Credits: 1-6 (RD)
Research on approved master's thesis topic under direction of thesis committee with approval of chair.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: S/NC

PSYC 810 - Psychological Assessment I
Credits: 4 (NR)
First of required two-course sequence that provides comprehensive coverage of principles, strategies, and techniques of psychological assessment. Emphasizes empirically supported methods.

Notes: Open only to clinical psychology PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

**PSYC 811 - Psychological Assessment II**

Credits: 4 (NR)
Second of required two-course sequence that provides comprehensive coverage of principles, strategies, and techniques of psychological assessment. Emphasizes empirically supported methods.

Notes: Open only to clinical psychology PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

**PSYC 816 - Neuropsychological Assessment**

Credits: 3 (NR)
Nature of brain behavior relationships in adults and children. Concentrates on major assessment techniques including Luria Nebraska, Halstead-Reitan, and Michigan Neuropsychological batteries.

Prerequisite(s): PSYC 702, 810, and 811; or 709 and 710

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 822 - Scientific Foundations of Clinical Psychology I**

Credits: 3 (NR)
First of required two-course sequence that provides comprehensive coverage of major psychological problems, including review of empirically supported interventions.

Notes: Open only to clinical psychology PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 823 - Scientific Foundations of Clinical Psychology II**
Second of required two-course sequence that provides comprehensive coverage of major psychological problems, including review of empirically supported interventions.

Notes: Open only to clinical psychology PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 830 - History, Systems, and Theories of Personality and Psychotherapy**

Credits: 3 (NR)
Review of history, systems, and theories of clinical psychology emphasizing traditional theories of personality and psychotherapy.

Prerequisite(s): Admission to doctoral concentration in clinical psychology.

Notes: Open only to clinical PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 831 - Social-Cognitive Interventions in Clinical Psychology**

Credits: 3 (NR)
Survey of procedures for altering emotional distress and behavioral dysfunction within the conceptual framework of social cognitive theory and cognitive behavioral therapy.

Notes: Open only to clinical psychology PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 832 - Group, Marital, and Family Psychotherapy**

Credits: 3 (NR)
Introduces major models of group, marital, and family functioning as well as current approaches to group, marital, and family psychotherapy.

Prerequisite(s): PSYC 822, 823, and 830.

Notes: Open only to clinical psychology PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PSYC 833 - Social And Cognitive Foundations Of Clinical Psychology

Credits: 3 (NR)
Review of theory and research in social psychology (particularly social cognition) relevant to understanding psychological adjustment, adjustment problems, and clinical interventions.

Notes: Open only to clinical psychology PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 840 - Community Psychology I

Credits: 3 (NR)
First of required two-course sequence. Comprehensive coverage of history, concepts, and practice of community-clinical psychology, including community mental health theory, consultation, prevention, program planning and evaluation, and human services management.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

PSYC 841 - Community Psychology II

Credits: 3 (NR)
Second of required two-course sequence. Comprehensive coverage of history, concepts, and practice of community-clinical psychology, including community mental health theory, consultation, prevention, program planning and evaluation, and human services management. Includes implementation of consultation project.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 850 - Teaching Practicum in Psychology

Credits: 1 (NR)
Workshop in effective teaching of selected undergraduate psychology courses. Required of and designed to guide graduate teaching assistants assigned to teach undergraduate course (not a lab) for first time. Topics include course planning, syllabus development, lecture resources, effective lecturing skills, use of audio visuals, leading of classroom discussion, construction and grading of exams, student writing, instructional technology, and handling of student questions and problems. Individual critiques of teaching.

Corequisite(s): Teaching assignment in an undergraduate psychology course.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Graduate Special
PSYC 860 - Introductory Helping Skills and Motivational Interviewing

Credits: 3 (NR)
Teaches fundamental interviewing skills and the theory, research, and practice of motivational interviewing.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 861 - Cognitive Behavioral Therapy for Youth

Credits: 3 (RD)
Teaches the selection, evaluation, and application of empirically supported interventions for children and adolescents with a focus on cognitive-behavioral interventions. Instruction in evidence based assessments, cognitive-behavioral case conceptualization, outcome evaluation, and consultation. Supervision of cognitive-behavioral therapy with youth.

Prerequisite(s): Permission of instructor.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PSYC 862 - Cognitive Behavioral Therapy for Adults

Credits: 3 (RD)
Teaches the principles of cognitive-behavioral theory, conceptualization and psychotherapy techniques for psychological problems with adults. Supervision of cognitive-behavioral therapy with adults.

Notes: May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

PSYC 881 - Practicum in Clinical Psychology

Credits: 1-3 (RT)
Supervised clinical work in a professional psychological services setting. Usually includes practice in psychological assessment and clinical interventions, but can also include supervision, consultation, and program evaluation.

Prerequisite(s): Admission to doctoral concentration in clinical psychology and permission of director.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

**PSYC 883 - Ethical and Professional Issues in Clinical Practice**

Credits: 3 (NR)
Examines ethical principles and professional guidelines to help develop ethical decision-making and behavior to meet the appropriate standards of care in providing clinical services.

Notes: Open only to clinical psychology PhD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**PSYC 885 - Clinical Externship**

Credits: 0 (RD)
Individual placements in psychological assessment or psychotherapy service settings.

Notes: Open only to clinical psychology PhD students in the third year or more of training.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

**PSYC 888 - Clinical Supervision: Theory, Research, and Practice**

Credits: 3 (NR)
Introduces students to theory, research, and practice of clinical supervision, with an emphasis on supervision of psychotherapy. Focuses on selecting effective supervision strategies, establishing and maintaining a positive supervisory relationship, and applying supervisory practices in accordance with current research and standards. Includes didactic and applied components.

Prerequisite(s): 6 credits of PSYC 881.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 890 - Seminar in Professional Psychology**

Credits: 1-3 (RD)
Each section limited to students in one concentration of MA or PhD program. See area coordinator for requirements for section in each track.
Prerequisite(s): Graduate student in psychology.

Notes: May be repeated for a maximum of 3 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: S/NC

**PSYC 892 - Special Topics in Psychology**

Credits: 1-6 (RT)
Selected topics reflecting specialized areas in psychology.

Notes: Open only to PhD students. Content varies. May be repeated for a maximum of 17 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 897 - Directed Reading and Research**

Credits: 1-3 (RT)
Independent reading on topic agreed on by student and faculty member.

Notes: PhD students in the clinical psychology concentration may not take this course for elective credit. May be repeated for credit. May not be repeated for credit towards a degree by students who also register for PSYC 799.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PSYC 998 - Doctoral Dissertation Proposal**

Credits: 1-6 (RD)
Work on research proposal that forms basis for doctoral dissertation.

Notes: May be repeated. No more than 24 credits of PSYC 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: S/NC

**PSYC 999 - Doctoral Dissertation**
Research on approved dissertation topic under direction of dissertation committee.

Prerequisite(s): PSYC 998

Notes: May be repeated. Students must complete a minimum of 3 credits of 999. No more than 12 credits of PSYC 998 and 999 may be applied to doctoral degree requirements.

Public Administration (PUAD)

Offered by the College of Humanities and Social Sciences

PUAD 502 - Administration in Public and Nonprofit Organizations

Credits: 3 (NR)
Graduate introduction to field of public administration. Focuses on structure, functions, and processes of executive branch agencies of national, state, and local governments. Emphasizes nonprofit organizations as co-actors with government in policy-making/policy implementation nexus.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 504 - Managing in the International Arena: Theory and Practice

Credits: 3 (NR)
Theoretical and empirical examination of international system that both affects and is affected by decisions, behaviors, and subsystems of state and nonstate (organizational) actors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 505 - Introduction to Management of Nonprofits

Credits: 3 (NR)
Examines nonprofit organizations and their role in contemporary society. Explores unique aspects of nonprofits including voluntary governance, tax-exempt status, nonprofit corporation law, accounting practices, fund raising, finance, and management of volunteers. Emphasizes board/executive relationship, and value of establishing and maintaining nonprofit organization's reputation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PUAD 509 - Justice Organizations and Processes

Credits: 3 (NR)
Examines structures, practices, and performance of organizations involved in administration of justice (law enforcement, courts and legal agencies, corrections, regulatory and related agencies, private organizations) Explores applicability of various theoretical perspectives on organizational processes, and considers extent to which processes operate as a system. Focuses on comparing formal goals and system expectations to actual practice.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 511 - Problem Solving and Data Analysis I

Credits: 3 (NR)
Techniques, skills for public managers to solve policy-related problems or analyze policy-related data. Focuses on problem definition, research design, and problem solving under conditions of uncertainty in public sector.

Equivalent to GOVT 511; PUAD 611 (2011-2012 Catalog)

Prerequisite(s): Passing grade on screening exam.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 520 - Organization Theory and Management Behavior

Credits: 3 (NR)
Considers behavior in context of public organization, and consequent changes required in management. Focuses on such issues as perception, attitude formation, motivation, leadership, systems theory, communication and information flow, conflict theory, and decision theory.

Equivalent to PUAD 620 (2011-2012 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 540 - Public Policy Process

Credits: 3 (NR)
Processes of making public policy, including detection of public issues, consideration of alternatives, and adoption and implementation of solutions. Highlights major actors in policy process, and environment within which they work.

Equivalent to PUAD 640 (2011-2012 Catalog)
Prerequisite(s): PUAD 502.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**PUAD 612 - Problem Solving and Data Analysis II**

Credits: 3 (NR)  
Techniques and skills for public managers to solve policy-related problems or analyze policy-related data. Focuses on data gathering and analysis, use of computers, systems theory and analysis, and operations research.

Prerequisite(s): PUAD 511.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**PUAD 613 - Economic Analysis in Public Administration**

Credits: 3 (NR)  
Covers major economic issues about role of markets and government in global world. Applies fundamental economic concepts such as cost benefit analysis to public sector.

Prerequisite(s): PUAD 511.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**PUAD 615 - Administrative Law**

Credits: 3 (NR)  
Covers law as guiding and controlling force in public-sector operations. Includes application of legal processes to administrative practices and situations, and administrative determination of private rights and obligations.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

**PUAD 621 - Principles and Practices in Government Organization and Management**

Credits: 3 (NR)  
Major management theories applicable to American federal system. Emphasizes organization, structure, and operations. Explores relationship of theories to management practices in contemporary American administration.

Prerequisite(s): PUAD 520.
PUAD 622 - Program Planning and Implementation

Credits: 3 (NR)
Practical exploration of implementing public law in American federal system. Studies construction of organizational apparatus, development of operational plans, and systems of control and evaluation necessary to implement government programs. Emphasizes coordinating tasks and resources required for effective program implementation.

Prerequisite(s): PUAD 520.

PUAD 623 - Managing Government Contracting

Credits: 3 (NR)
Explores unique management and administrative challenges of providing public goods and services through contracts. Examines debates over privatization, and explores tools managers need to address unique accountability challenges associated with this governance tool.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 624 - Public and Private Partnerships

Credits: 3 (NR)
Emphasizes entrepreneurial efforts where governments, nonprofit organizations and private companies establish goals and combine resources and talents. Issues of efficiency, accountability, and democratic responsiveness will be examined. Various tools for promoting and implementing such partnerships will be explored.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 625 - Higher Education Law

Credits: 3 (NR)
Analyzes legal issues confronting higher education: governance, faculty matters, and student issues. Examples include due process, freedom of speech, and privacy. Reviews key constituents in higher education-students, faculty, administrators, board of trustees, and parents -and how their roles are changing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PUAD 626 - Consulting Management

Credits: 3 (NR)
Explores the consulting industry, changes in the industry and future expectations of consulting as a career. Examines different sectors of consulting such as HR, IT, Operations, Marketing, Succession Planning, Organizational Consulting, Knowledge management, Non-profit and health care and government consulting.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 630 - Emergency Planning and Preparedness

Credits: 3 (NR)
Provides an understanding of the issues associated in developing plans and policies to prepare for disasters, both natural and man made. Overview of nature of challenges posed by different kinds of disasters; discussion of regulatory requirements, sample plans, equipment requirements, collateral and mutual aid support agreements, and methods for testing and updating plans.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 631 - Disaster Response Operations and Recovery

Credits: 3 (NR)
Explores the principles and practices that promote effective disaster response operations and management. Examines nature of disasters, models for response operations in the United States and roles and responsibilities of various emergency management-related organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 632 - Terrorism: Theory and Practice

Credits: 3 (NR)
Introduces students to the subject of terrorism including the history and evolution of terrorism, case studies of key terrorist groups, the current nature of the terrorist threat, and counterterrorism strategies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 633 - Hazard Mitigation Policy
Credits: 3 (NR)
Examines the complex interplay and policy approaches to hazard prevention and protection of known hazards in terms of land
use, zoning, infrastructure, and building code management. Focuses on understanding the relative roles of proactive policy design
and implementation at the federal, state, and local levels of government.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 634 - Management of International Security

Credits: 3 (NR)
Examines theory and practice of managing international security. Emphasizes interplay of organizational structure and
bureaucratic dynamics in international context. Presents theory and practice of crisis management, and coordination and
comparison of security methods and techniques.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 635 - Emergency Preparedness: Interagency Communication and Coordination

Credits: 3 (NR)
Considers complex relationships within governments and across sectors and levels of government for effective emergency
management in planning, response, recovery, and mitigation phases. Explores intergovernmental management and network
management theories and research to understand the nature of interorganizational problems and potential models for
collaboration.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 636 - The NGO: Policy and Management

Credits: 3 (NR)
Explores unique aspects of nonprofit organizations operating in international environments, particularly in relief and
development work. Examines relationship between NGO and U.S. and foreign governments. Covers international philanthropy;
cross-cultural understanding; and key managerial concerns such as communications, planning, human resource management,
control, group process, and project evaluation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 637 - Managing Homeland Security

Credits: 3 (NR)
Focuses on the Department of Homeland Security and will cover the statutory law that provides the foundation for the
department, the resources appropriated to the department, the determination of strategy and priorities, the development of operational capacity, and other challenges associated with top-level (secretarial) management of the department and its principal bureaus.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUAD 642 - Environmental Policy**

Credits: 3 (NR)

In-depth examination of environmental policy making. Examines U.S. efforts from 1970 to present to mitigate pollution of nation's air, land, and water; and addresses issues of global concern including biodiversity loss, ozone depletion, and climate change. Designated a Green Leaf Course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUAD 644 - Public Policy Models**

Credits: 3 (NR)

Approaches to modeling policy problems. Includes analysis and comparison of dominant paradigms in policy sciences. Reviews assumptions and implications of different models and their utility for analysis, implementation, and evaluation.

Prerequisite(s): PUAD 540.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUAD 645 - Policy Analysis**

Credits: 3 (NR)

Introduces concepts and techniques for formal policy analysis, development of skills in applying policy analysis techniques through case studies, and exploring legitimacy and utility of policy analysis.

Equivalent to PUAD 741 (2011-2012 Catalog)

Prerequisite(s): PUAD 502, PUAD 511, PUAD 540.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUAD 646 - Program Evaluation**
Credits: 3 (NR)  
Introduces concepts and techniques for formal policy analysis, development of skills in applying policy analysis techniques through case studies, and exploring legitimacy and utility of policy analysis.

Equivalent to PUAD 742 (2011-2012 Catalog)

Prerequisite(s): PUAD 502, PUAD 511.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

PUAD 649 - Advocacy and Lobbying

Credits: 3 (NR)  
Explores how nonprofit organizations advocate and lobby for social change. Considers the different steps in the advocacy process and the broad range of strategies used by nonprofits seeking to influence public policy.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

PUAD 651 - Virginia Politics, Policy, and Administration

Credits: 3 (NR)  
Cultural, demographic, constitutional, and socioeconomic environment of public administration in Virginia. Covers governmental agencies, legislative functions, executive leadership, staff agencies, state-local relationships, intrastate regionalism, administrative customs peculiar to Virginia.

Prerequisite(s): PUAD 502.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

PUAD 652 - Nonprofit Leadership and Change

Credits: 3 (NR)  
Examines the principles of leadership and the process of change within the context of the nonprofit sector and its role in the community. Looks at current changes and challenges within the nonprofit sector and their effect on the sector and society as a whole.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

PUAD 654 - The Community, Marketing, and Public Relations
Focuses on marketing concepts and communications issues of nonprofit organization as they apply to identifying market, ability to formulate public image and reputation, and capability to raise money and retain membership or volunteers.

Prerequisite(s): PUAD 502 or 505.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 655 - Philanthropy and Fund Raising

Credits: 3 (NR)
Examines history of philanthropy and relationship to nonprofit, government, and commercial sectors in United States. Studies principles of financial development including governance, development of organizational capacity, and identification of funding sources and donor motivations. Provides understanding of fund raising techniques that generate financial support for nonprofits, and context in which these methods may be used.

Prerequisite(s): PUAD 502 or 505

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 657 - Association Management

Credits: 3 (NR)
Practical application of management theory in context of professional and trade associations. Covers legal structures, tax-exempt status, and general organizational structure. Topics include volunteer management, budgeting and accounting practices in associations, fund raising, media relations, media and event planning, and human resource management.

Prerequisite(s): PUAD 502 or 505

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 658 - Social Entrepreneurship and Nonprofit Enterprise

Credits: 3 (NR)
Explores innovative approaches for addressing social problems. Organized around the steps in the entrepreneurial process: identifying social needs, formulating program strategies, mobilizing resources, managing growth tracking results, and maximizing impact.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 659 - Nonprofit Law, Governance, and Ethics
Overview of nonprofit governance as well as basic contract, labor, and tax law issues within nonprofit corporation law. Covers relationship between board and executive, and ethics topics typical to nonprofit organizations such as self-dealing, fiduciary responsibility, and human resource issues.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 660 - Public and Nonprofit Accounting and Finance

Credits: 3 (NR)
Studies fundamental normative debates in public and nonprofit financial management arena with focus on resulting implementation principles and techniques in governmental accounting, financial reporting, budget and revenue decisions, debt management, cash and investment management, pensions and employee benefits, and risk management.

Prerequisite(s): Course open only to admitted MPA or association/nonprofit management certificate students

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 661 - Public Budgeting Systems

Credits: 3 (NR)
Survey focusing on policy and theoretical framework of revenue and expenditure choices at all levels of government. Topics include development, theories, structure of budgeting; political, economic, and managerial aspects of public budgeting; public policy implications; and budgetary reform movements and successes and failures.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 662 - National Budgeting

Credits: 3 (NR)
Examines formulation of overall national fiscal policy and budgetary priorities through presidential and congressional budget processes, including decisions over spending and revenues.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 663 - State and Local Budgeting

Credits: 3 (NR)
Introduces state and local government budgeting including principal actors and institutions inside and outside state and local governments that play role in budget development, appropriation, implementation, and auditing.
PUAD 664 - Nonprofit Financial Management

Credits: 3 (NR)
Covers nonprofit financial management with attention to conflicts between social mission and financial entrepreneurship. Topics include mission, budgeting, fund raising, commercial programs, investments, accounting and information systems, financial reporting, auditing, and internal control.

Prerequisite(s): Admission to MPA, certificate in association management, or certificate in nonprofit management.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 670 - Human Resources Management in the Public Sector

Credits: 3 (NR)
Overview of range and complexity of functions, responsibilities, and expectations of human resource staff and line managers in public sector. Focuses on human resources management in context of political, legal, and managerial systems. Human resource functions, such as hiring, performance, and development, are also presented.

Prerequisite(s): PUAD 502.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 671 - Public Employee Labor Relations

Credits: 3 (NR)
Public employee labor relations, including unionization, representational elections, bilateral policy negotiations, administration of agreements, management rights, union and membership security, strike issue and grievance procedures, impact on public administration, and assessment of future developments.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 672 - Human Resources Reforms for Public Administration

Credits: 3 (NR)
Explores recent reforms in human resources management in federal, state, and local governments. Covers pay for performance systems, flexible assignment patterns, incentives for productivity, work-life balance, job design, and changes resulting from higher levels of contracting for government programs.
PUAD 680 - Managing Information Resources

Credits: 3 (NR)
Examines how managerial and analytical functions in public organizations can be performed via end-user computer applications. Provides in-depth coverage of selected database and decision support packages, and gives attention to logic and integration of application software.

Prerequisite(s): Admission to MPA program, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 691 - Justice Program Planning and Implementation

Credits: 3 (NR)
Covers development and construction of organizational systems to implement government policies and programs. Emphasizes dealing with real-world challenges, constraints, and opportunities to create feasible plans, performance-monitoring systems, and secure multiple agency coordination. Applications of planning and implementation principles to actual projects in justice agencies.

Prerequisite(s): PUAD 502 and 509.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 700 - Ethics and Public Administration

Credits: 3 (NR)
Topics of ethical dimensions including constitutionalism, democratic values and traditions, standards of conduct and ethics, and conflicting values of public officials and social equity of public programs.

Prerequisite(s): PUAD 502, PUAD 511, PUAD 520, and PUAD 540.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 701 - Cross-Cultural and Ethical Dimensions of International Management

Credits: 3 (NR)
To be taken in final two semesters of MPA program. Examines normative issues in management of programs in international
context. Emphasizes interplay of cultural, sociopolitical, legal, and ethical factors, and management and policy problems arising from conflicting goals, values, and inequities among nations and regions.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUAD 703 - Third-Party Governance**

Credits: 3 (NR)  
Examines design and management of government programs relying on other levels of government and private sector for delivery, with focus on such governmental tools as contracts, grants, loans, regulation, and tax credits.

**Prerequisite(s):** PUAD 502, PUAD 511, PUAD 520, and PUAD 540. Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUAD 720 - Performance Measurement**

Credits: 3 (NR)  
Methods used by managers to systematically assess performance. Includes practical tools such as focus groups, survey research, cost/benefit analysis, benchmarking, and comparison methods for revealing outcomes and impacts. Prepares managers to use information more effectively in developing programs and services and formulating policy, and covers reporting techniques to communicate performance results.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUAD 727 - Seminar in Risk Assessment and Decision Making**

Credits: 3 (NR)  
Examines decision making under risk and uncertainty. Readings introduce major intellectual perspectives on topic and are drawn from variety of disciplines, including biology, economics, law, and psychology. Emphasizes making actual decisions under uncertainty.

**Prerequisite(s):** 12 graduate credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUAD 729 - Issues in Public Management**

Credits: 3 (RT)  
Current issues in management of public organizations in contemporary American government. Includes practical applications of
theories and analysis to managerial problems. Emphasizes competence in improving management in selected government settings.

**Prerequisite(s):** PUAD 502, and 9 graduate credits.

**Notes:** May be repeated for credit when topic is different.

**Hours of Lecture or Seminar per week:** 1-3

**PUAD 730 - Professional Development Workshop**

Credits: 1-3 (RT)
Explores external and internal factors reshaping public and nonprofit organizations. Investigates processes and techniques that managers and staff can use to respond to rapid environmental change. Emphasizes case studies and application of techniques and processes.

**Hours of Lecture or Seminar per week:** 1-3

**Hours of Lab or Studio per week:** 0

**PUAD 731 - Homeland/Transportation Security Administration**

Credits: 3 (NR)
Examines the terrorist attacks of 9/11, the vulnerabilities of the aviation security system at that time, reasons why elected leaders and officials did not act more decisively to improve security before 9/11, and the policy and administration responses to the 9/11 attacks, including the creation of the Transportation Security Administration and the Department of Homeland Security. Includes the development of radical Islam and the rise of Osama bin Laden and Al Qaeda.

**Hours of Lecture or Seminar per week:** 3

**Hours of Lab or Studio per week:** 0

**PUAD 738 - Issues in International Security**

Credits: 3 (RT)
Examines issues of topical interest in general area of international security. Possible topics include nuclear strategy, disarmament, American defense policy, and international terrorism.

**Prerequisite(s):** PUAD 504 and 9 graduate credits.

**Notes:** May be repeated for credit when topic is different.

**Hours of Lecture or Seminar per week:** 3

**Hours of Lab or Studio per week:** 0

**PUAD 739 - Issues in International Management**
Examines significant current issues in public international management. Emphasizes practical applications of theories and analysis of problems in public international management arena, and competence in improving management practices in international management settings.

Prerequisite(s): PUAD 502, and 9 graduate credits.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUAD 749 - Issues in Public Policy**

Credits: 3 (RT)
Examines significant issues in public policy in contemporary American government. Emphasizes practical applications of theories and analysis to policy problems, and competence in improving policy analysis in selected government settings.

Prerequisite(s): PUAD 502, and 9 graduate credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUAD 750 - Federalism and Intergovernmental Relations**

Credits: 3 (NR)
Examines broad trends in governance, including theory and practice of federalism, with particular focus on intergovernmental relations and changing roles of federal, state, and local governments. May include privatization, devolution, mandating, regulatory reform, and comprehensive federalism reform.

Prerequisite(s): PUAD 502 and 9 graduate credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUAD 758 - Environmental Politics**

Credits: 3 (NR)
Evolution and current state of environmental policy making. Includes history, strengths, and weaknesses of key U.S. environmental laws and central international environmental agreements. Introduces analytical approaches, including cost-benefit and risk analysis. Discusses economic incentives and normative considerations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PUAD 759 - Issues in Local Government Administration

Credits: 3 (RT)
Management and policy formulation in American local governments. Addresses environments, institutions, and actors involved. Examines contemporary problems such as education, criminal justice, transportation, land use, economic development, and environmental impact.

Prerequisite(s): PUAD 502 and 9 graduate credits.

Notes: May be repeated with different topic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 769 - Issues in Public Financial Management

Credits: 3 (RT)
Current issues in budgeting and financial management in contemporary American government. Emphasizes practical applications of administration and management issues and policy choices at all levels of government.

Prerequisite(s): PUAD 502, and 9 graduate credits.

Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 781 - Information Management: Technology and Policy

Credits: 3 (NR)
Examines challenges that organizations encounter as they move to a more technologically sophisticated information and communication environment. Studies organizational policy issues evolving from new technologies, including privacy, security, authentication, content control, intellectual property, and taxation, focusing on effectiveness of previous policy solutions and analyzing proposed solutions.

Prerequisite(s): PUAD 680, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 790 - Justice Organization and Administration

Credits: 3 (NR)
Examines organization and administration of justice and security organizations. Covers organization theory and behavior as applied to justice and security organizations.
PUAD 791 - Justice Program Evaluation

Credits: 3 (NR)
Practical exploration of assessment techniques used to study need for and consequences of justice programs and policies. Covers needs assessments, process, and impact evaluations. Includes design and measurement issues for assessing performance of justice programs, and interpreting and presenting results. Emphasizes designing program evaluation for justice agency.

Prerequisite(s): PUAD 511 and 612.

PUAD 792 - Advanced Seminar in Applied Public Administration Research

Credits: 3 (NR)
An applied research experience. Students will apply skills in problem definition, issue framing, collection of data and information, interviewing, selection and analysis of alternatives, presentation of findings and recommendations, design of implementation tools and administrative procedures and organizations, report writing and oral presentation to policymakers.

Prerequisite(s): 30 PUAD credits and permission of instructor.

PUAD 793 - Conduct of Justice Organizations at the Street Level

Credits: 3 (NR)
Explores how justice organizations behave at lowest levels, where service is delivered and discretion is greatest. Includes suspects, victims, witnesses, police officers, prison guards, parole officers, attorneys, and others who interact with the justice system.

Prerequisite(s): CRIM 740/GOVT 790, or permission of instructor.

PUAD 794 - Internship

Credits: 1-6 (RD)
Open only to MPA students. Contact internship coordinator one semester before enrollment. Credit determined by the department.
Prerequisite(s): 12 PUAD credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

PUAD 795 - Leadership in Justice and Security Organizations

Credits: 3 (NR)
Examines leadership theories, and explores fundamental questions about leadership in justice and security organizations today.

Prerequisite(s): CRIM 740/PUAD 790, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 796 - Directed Readings and Research

Credits: 1-3 (RT)
Reading and research on specific topic under direction of faculty member. Written report is required; oral exam covering research and report may be required.

Prerequisite(s): 18 PUAD credits and permission of instructor.

Notes: May be repeated once.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 797 - Changing Justice and Security Organizations

Credits: 3 (NR)
Examines challenges of changing justice organizations, how changes have been successfully and unsuccessfully implemented in the past, and what change strategies appear to be most effective.

Prerequisite(s): CRIM 740/PUAD790 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUAD 821 - Doctoral Seminar in Theories of Organization and Bureaucracy
Examines key issues in organization theory and behavior. Issues include organization design; interorganizational coordination, intelligence and decision-making systems; leadership and motivation theories; and theories or organizations as agents of political and social change. Uses case studies.

**Prerequisite(s):** PUAD 520 or equivalent, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PUAD 840 - Research Seminar in Policy Governance I**

Credits: 2-4 (NR)  
Surveys major institutions that formulate and implement public policy in United States. Examines translation of public preferences into public policy, and decisions about which societal and economic functions are most appropriately carried out by governments, and which are best accomplished by private institutions and individuals.

Equivalent to PUBP 840

**Prerequisite(s):** Admission to doctoral program or permission of instructor.

**Hours of Lecture or Seminar per week:** 2-3  
**Hours of Lab or Studio per week:** 0-1

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**PUAD 841 - Research Seminar in Policy Governance II**

Credits: 2-4 (NR)  
Second of two-semester sequence (PUAD 840, 841) in governance and public management policy concentration. Focuses on division of responsibilities among several levels of government, and between public and private sectors. Explores impact of these divisions on development of public policy in several policy areas, such as urban governance, environmental policy, and health care.

Equivalent to PUBP 841

**Prerequisite(s):** Admission to doctoral program.

**Hours of Lecture or Seminar per week:** 2-3  
**Hours of Lab or Studio per week:** 0-1

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**Public Policy (PUBP)**

Offered by the School of Public Policy

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**PUBP 501 - Policy and Organizational Analysis**
Prepares students to engage in systematic analysis, both qualitative and quantitative, and constitutes the basis for advanced analytical techniques. Emphasis on research design, information acquisition, application of data analysis techniques, and presentation, including writing for professional and lay audiences.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 502 - Governance and Policy Processes

Credits: 1-4 (NR)  
Assesses governance processes in public and private organizational settings on the basis of economic and political standards such as efficiency, accountability, and responsiveness to societal needs in a rapidly changing global environment. Using cases, simulations, and fieldwork, students learn to evaluate the quality of institutional governance in specific venues and appraise implications for public policy.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 503 - Culture, Organization, and Technology

Credits: 1-4 (NR)  
Focuses on the influence of culture in societal, political, economic, and technological processes, nationally and internationally. Culture is seen as dynamic and interactional. Using case studies, students learn pertinent approaches to the study of culture, from the analysis of organization and social networks to that of belief systems and identities. Students also develop practical skills in observation, participation, and intervention.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 511 - Quantitative Methods in Public Policy

Credits: 3 (NR)  
Introduces students to the range of quantitative methods used for public policy analysis. Provides a broad foundation to prepare students for doing statistical analysis on the master's level.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 533 - Topics in Public Policy Processes

Credits: 1-3 (RT)  
Focuses on selected topics in public policy processes and procedures on an introductory level.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 550 - Topics in Public Policy**

Credits: 1-3 (RT)
Focuses on selected topics in public policy not covered in fixed-content public policy courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 555 - Economics Math Workshop**

Credits: 0 (RD)
Short course covering math and calculus skills required for master's level managerial economics course PUBP720.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Not Gradable

**PUBP 556 - Writing Workshop**

Credits: 0 (RT)
A limited enrollment, noncredit, one-day workshop designed for master-level public policy students who want to improve their writing skills. Aimed at good writers who want to move to the next level of effectiveness. Taught by professional writers.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Not Gradable

**PUBP 601 - Theory and Practice of Regional Economic Development**

Credits: 3 (NR)
Helps students develop real-world skills to be a successful economic developer, consultant, policymaker, or change agent in this rapidly changing environment. Designed to provide a framework for understanding regional and national economic growth and prosperity, and provide tools to conduct concrete analyses to help decision makers, clients, and constituents make better-informed decisions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 602 - Regional Economic Development: Strategies and Applications**
Introduces range of methods for tracking the performance of metropolitan economies, identifying opportunities for economic development, and assessing effectiveness of public and private investments designed to achieve region's economic growth. Also examines strategies and case results of economic development plans and projects.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PUBP 605 - State and Local Government Policy and Economic Development**

Credits: 3 (NR)  
Examines state and local government policies and processes to promote local economic development, including institutional arrangements, financing and tax incentives, nonfinancial strategies and approaches, land use, environmental and other relevant regulations, and relationships across government and nongovernmental organizations.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**PUBP 610 - Organizations, Management, and Work: Theory and Practice**

Credits: 2 (NR)  
This introduction to organizations, management, and work examines ideas and practices from two perspectives: conventional ones that go back to the industrial age and scientific management; and contemporary ones that have to do with organizing knowledge-work. Covers contributions of a range of writers and deals with foundations of OD from the standpoint of both theory and practice.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**PUBP 611 - Critical Infrastructure Protection in Theory, Policy and Practice**

Credits: 2 (NR)  
Introduces critical infrastructure protection as a policy field, examines its institutional framework, and considers its foundations in political and economic theory.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

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**PUBP 650 - Peace Operations I**

Credits: 3 (NR)  
First course of two-semester sequence on international peace operations. Focuses on emerging theory of peace operations,
including peacemaking activities of United Nations and other diplomatic initiatives; peace-building activities of international organizations and nongovernmental organizations; and peace support provided by international militaries.

### PUBP 651 - Peace Operations II

Credits: 3 (NR)
Second course of two-semester sequence on international peace operations. Focuses on application of emerging theory of peace operations, including peace-making activities of United Nations and other diplomatic initiatives; peace-building activities of international organizations and nongovernmental organizations; and peace support provided by international militaries. Several guest lectures from past and present peace operations provide practical information for future staff of peace operations.

### PUBP 652 - Experiential Applications

Credits: 4 (NR)
This course concentrates on the institutional mindsets, characteristics, and behaviors of the actors involved in peace operations. Readings, role-plays, and research underpin the class. Special attention is also paid to developing students’ graduate-level research and writing skills.

### PUBP 653 - The Interagency Process

Credits: 3 (NR)
Examines the U.S. Interagency process as it relates to peace operations. Various departments and agencies maintaining equities in overseas missions will be identified and explored. Case studies highlight instances of success or failure in application of a "whole-of-government" approach to intervention. Examines significant problems hampering Interagency cooperation today and recent policy directives, frameworks, and initiatives developed to address this situation.

### PUBP 654 - Analysis for Peace Operations

Credits: 3 (NR)
Examines theories of human behavior and social systems as they relate to conflict at the interpersonal, community, and
international level. The class provides a foundation of academic thinking about the role of conflict in violent and peaceful social change. At the end of the course, students should be able to think systematically and critically about conflict, and engage in practical application of conflict analysis techniques to peace operations.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**PUBP 700 - Theory and Practice in Public Policy**

Credits: 3 (NR)  
Theories of public policy emphasizing historical intellectual development, and role theory and ethics may play in public policy making. Assumptions made by policy professionals examined against broad range of philosophical, social, political, and economic imperatives affecting public policy environment.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 702 - Comparing Political Institutions**

Credits: 3 (NR)  
Examines political institutions and processes from comparative and international perspectives, and role of political environment in economic trade and investment policy decisions. Examines how generalizability, objective knowledge and understanding, and nature of evidence impact public policy.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 704 - Statistical Methods in Policy Analysis**

Credits: 3 (NR)  
Graduate-level introduction to statistical methods and techniques used in policy sciences. Topics include descriptive statistics, sampling and probability theory, graphical data display, estimation and significance testing, contingency tables, bivariate regression and correlation, and multiple regression, with introduction to computer based statistical analysis.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 705 - Advanced Statistical Methods in Policy Analysis**

Credits: 3 (NR)  
Covers classical regression methods and their application to public policy analysis. Includes simple and multiple regression, analysis of variance, time series, and simultaneous equation structural models. Problems associated with applications include specification error, multicollinearity, qualitative variables, heteroskedasticity, serial correlation, and structural identification.
Course develops analysis skills by discussing sample empirical studies and models using advance statistical computer software.

**Prerequisite(s):** PUBP 704 or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0


Credits: 3 (NR)  
Studies analytical concepts and techniques used in public-sector overall budgetary and specific project decision making. Includes conceptual concerns and quantitative techniques used in benefit-cost analysis, capital budgeting, financial analysis, and various specialty applications, such as economic and fiscal impact analysis. These are all interrelated by the desire to measure the benefits versus the costs of various alternative public decisions. Attention is given to measuring results over time and the use of present value techniques. Assesses strengths and weaknesses of analytical techniques. Emphasizes the process of defining the appropriate stakeholders affected by decisions, the sources and quality of data, and the rigor of conducting studies.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 709 - Professional Writing for Policy**

Credits: 3 (NR)  
Professional Writing teaches effective writing for the professions. The course includes the fundamentals of writing -- grammar, word usage and paragraphing -- and instruction in selected genres, including news stories, editorials, and research writing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 710 - Topics in Public Policy**

Credits: 1-3 (RT)  
Focuses on selected topics in public policy not covered by fixed-content public policy courses.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 711 - Modeling Policy in Dynamic Environments**

Credits: 3 (NR)  
Introduces basics of policy making and decision analysis, with major focus on hands-on development and use of systems.
dynamics-based models.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 712 - Policy Systems Analysis and Management Science

Credits: 3 (NR)  
Introduces analytical models and analysis to support decisions. Primary emphasis on understanding techniques of operation research and management science, cost benefits, and cost effectiveness for public decision making. Using mathematical details of algorithms to solve models not emphasized except as it contributes to understanding reliability and validity of methodologies. Through case studies and computer solutions, offers appreciation of when, where, and how to use models. Students demonstrate their understanding of techniques by applying them to term research project on government program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 713 - Policy and Program Evaluation

Credits: 3 (NR)  
Examines how programs of public agencies are proposed, established, operated, and evaluated. Covers role of research in program evaluation process, including alternative methodologies for policy assessment. Considers demand estimation, supply and pricing of publicly produced goods and services, and role of subsidies in nonmarket environments.

**Prerequisite(s):** PUBP 704 or equivalent.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 714 - Topics in Transportation Policy, Operations, and Logistics

Credits: 1-3 (RT)  
Issues in transportation policy, operations and logistics in United States and abroad. Includes practical applications of theories and analysis to policy problems, and emphasizes competence in improving policy in selected domains. May be taken up to three times and simultaneously for sections addressing different subject matter.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 715 - Introduction to Transportation Systems

Credits: 3 (NR)  
Transportation is a service that contributes substantially to well-being of advanced economies. Resource requirements and byproducts of transportation also pose sobering environmental challenges for society. Course examines history and development
of transportation systems; contribution to and impact on society; institutions and practices that govern planning, design, construction, operation, maintenance, and retirement from service; and policy and managerial challenges, and tools and techniques for addressing them.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 716 - Transportation Operations and Logistics

Credits: 3 (NR)
Provides survey of issues, methods, problems, and strategies. Topics include origins of logistics, industry structure, pricing, underwriting, rate making, compliance, inventory effects, just-in-time inventory management (JIT), materials requirements planning (MRP), customer service and order processing operations, sales functions and operations, dispatch and fleet manager functions and operations, rate-setting among three parties, typical electronic and paper document flow, routing and scheduling, route selection, satellite load tracking through dispatch-customer web inquiry, role of ITS in route selection, toll system use, congestion, training activities, and logistics markets.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 717 - Analysis for Transportation Managers

Credits: 4 (NR)
Introduces basic methods of transportation analysis and evaluation relating them to policy framework. Covers descriptive statistics, hypothesis testing, contingency tables (Chi-Square analysis), regression, optimization, demand elasticities, and gravity model. Also covers sources of transportation data and research design. Teaches mathematical base and logic of each technique, but primary emphasis is applying methods to relevant policy and management problems. Students required to complete series of assignments along with research proposal focused on applying one or more methods to problem of their own interest.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 718 - Transportation Planning and Policy

Credits: 3 (NR)
Introduces highway, rail, air, and water transport planning in United States. Teaches legislative, organizational, fiscal, legal and political environment within which planning for transportation facilities and services takes place. Introduce technical and analytical methods for transportation planning. Focus is largely on public sector, but also considers commercial transport planning and role of private sector in helping to design, manage, and finance transport systems.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 719 - Transportation Law
Credits: 3 (NR)
Examines legal environment of transportation. Topics include basic legal concepts and institutions, history and evolution of price and service regulation, environmental law and regulation, labor relations, and property.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 720 - Managerial Economics and Policy Analysis

Credits: 3 (NR)
Introduces microeconomics theory and its application in analyzing public policy issues. Provides capability to understand economic literature and theories.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 721 - Transportation Economics

Credits: 3 (NR)
Provides basis for understanding economics of transport system, and how transportation relates to urban and regional development. Treats transport generically, but includes case studies of specific modes.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 722 - Practicum in Transportation Policy, Operations, and Logistics

Credits: 3 (NR)
In-depth field study of ongoing transportation policy, operations, or logistics situations; and design and delivery of actions to manage or resolve problems and opportunities. Range of application areas depends on interests of student body and opportunities faculty identify for “clients” or real-world projects. Illustrative domain areas include surface transportation (highways and transit), airports, and aviation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 723 - Metropolitan Transportation Policy

Credits: 3 (NR)
Recent changes in federal legislation have led to renewed importance for transportation policy and planning. Considerations of clean air, economic development, congestion management, and changing urban form have greatly increased importance of well-planned transportation facilities and policies. Course introduces basic methods of transportation policy analysis and evaluation. Topics include data collection, simplified demand estimation techniques, transportation choice modeling, transportation supply analysis, and ex-ante and ex-post evaluation methods.
PUBP 724 - Intelligent Transportation Systems and Technology

Credits: 3 (NR)
Overview of intelligent transportation systems (ITS), which include wide range of information technology applications to surface transportation. ITS categories include traffic management, traveler information, fleet control, commercial vehicle regulation, transit, rural, and vehicle-control systems. Key institutional and policy issues involve the appropriate federal role in ITS; state and local government collaboration; public-private partnerships; how privacy interests can be protected as ITS surveillance and enforcement technologies become increasingly sophisticated; and how driver information systems, including cell phones, can be used to optimal advantage without burdening drivers with information overload.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 725 - International Transportation Logistics

Credits: 3 (NR)
Focuses on making efficient match between new demands on transportation, and ways demands can be met. Topics embody multidisciplinary approach to international transportation logistics drawing on economics, law, information technology, and network analysis. Includes international supply-chain management, global performance indicators, international intermodal transportation, air-freight logistics, new technologies, and border-crossing issues.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 726 - Telecommunications Policy

Credits: 3 (NR)
Examines salient issues associated with telecommunications and electronic commerce in context of public policy questions facing decision makers in government, education, and business. Examples include privacy, electronic signatures, digital divide, bandwidth auctions, IP telephony, CRM, Bluetooth, and Internet taxation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 727 - Transportation Evaluation

Credits: 3 (NR)
Transportation impinges on many aspects of life: economic, social, and political. Provision and operation of transportation services involves a wide range of trade-offs. Course looks at range of evaluation techniques and concepts applied in making decisions over such matters as transportation investments, transportation operating strategies, and public policy as it affects
transportation. Considers theory and concepts as well as more detailed assessments of standard evaluation methods used in United States and elsewhere. Case studies reviewed in depth.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 728 - Fleet Operations**

Credits: 3 (NR)
Overview of most important factors affecting fleet operations today. Topics include goals for government fleet operations and privately owned fleets, proforma cost analysis, fleet operations including route and vehicle and operator selection, asset-based versus non-asset based fleets, fleet design and make-up based on multiple objectives, scheduled maintenance requirements and trade-offs, shared capacity issues, reverse logistics policies, costs, operations, environmental constraints on fleets, fuel logistics, fleet decision-making, competitive and market challenges, and opportunities in fleet management.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 729 - Transportation Asset Management**

Credits: 3 (NR)
Introduces main elements that have attracted significant attention over the past decade. Several developments have challenged traditional framework for transportation service delivery, including changes in transportation environment; shift in public's attitude toward provision of public goods; and extraordinary advances in communication and computer technologies. Adoption of transportation asset management poses significant challenges on both organizational structure and existing knowledge base within transportation agencies. Course provides overview of these challenges, and introduces theoretical frameworks within which challenges may be analyzed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 730 - US National Policy Systems and Theory**

Credits: 3 (NR)
Provides inquiry into policy-making environment, organized around U.S. federal system. Examines nation's policy systems and key components: actors, institutions of governance, outside groups, and other influential interests. Special emphasis on dynamic character of policy making. In addition, different policy theories discussed in context of current political realities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 731 - Macroeconomic Policy Assessment**
Credits: 3 (NR)
Covers monetary theory, theories of consumption and saving, budget deficits, economic growth, international finance, and monetary and fiscal policy. Investigates national income and product accounts, savings, employment, and investment, and alternatives to Keynesian principles. Evaluates theories of inflation, investment, capital accumulation, and nonproportional growth.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 733 - Urban Politics and Policy

Credits: 3 (NR)
This course explores the factors that guide and affect urban politics and policy including, but not limited to, housing, public education, criminal justice, employment, and economic development. It is designed to provide students with an introduction to the major theories and some of the significant research in urban politics and policy. The primary focus will be on large American cities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 734 - Administrative Law and Public Policy

Credits: 3 (NR)
Covers administrative discretion, rule-making and agency proceedings, public participation, political accountability, regulatory processes, oversight, formal adjudication and informal action, lobbying agency administrators, and political and legal nature of the administrative process.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 735 - Lobbying and Interest Representation

Credits: 3 (NR)
To work effectively within a democratic political environment, policy analyst must understand contemporary methods used to influence policy. Course focuses on roles and techniques of organized influence, and its impact on policy.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 736 - International Migration and Public Policy

Credits: 3 (NR)
Examines demographic, economic, political, and social forces driving international migration on a global basis in the twenty-first century. Considers policy responses within sending and receiving countries and at the global level, including the role of...
international cooperation and institution-building.

PUBP 737 - Cases and Concepts in E-Government

Credits: 3 (NR)
Electronic government has become a significant public policy issue worldwide. It offers the prospect of dramatic improvements in delivering government services, but also portends major debate about government intrusion. Course covers emerging public policy issues associated with electronic government: job displacement in public sector, privacy, procurement and supply chain management, voter profiling, scope of government services, challenges to “digital democracy,” Internet-based voting, land management, the “digital divide,” and others.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

PUBP 739 - Media and Public Policy

Credits: 3 (NR)
Explores complex relationship between media and public policy. Examines how these forces collide in our modern media, how coverage decisions regarding public policy are made in newsrooms, how advocates use and rely on the media to advance message, and how different media reflect different strengths and vulnerabilities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 740 - U.S. Foreign Policy: Formulation and Practice

Credits: 3 (NR)
Focuses on policy formulation and policy implementation. The principal arenas of foreign policy are explored, including the White House, the State Department, the defense and intelligence communities, and the Congressional committees. These arenas are both affected by and influential upon the exogenous systems, such as the media, public opinion, interest groups, foreign governments, and international organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

PUBP 741 - U.S. Financial Policy Processes and Procedures

Credits: 3 (NR)
Examines design and operation of expenditure and revenue systems at federal, state, and local levels of U.S. government.
Stresses mobilizing and allocating resources through planning, adoption, and execution of budget. Includes theory and policy objectives of tax and spending regimes and review of financial controls, performance measurement, cash and debt management, and accounting and financial reporting systems.

**PUBP 742 - Transportation Safety and Security**

Credits: 3 (NR)
Examines transportation safety and security from multimodal perspective for both passenger and freight. Topics include historical context and policy framework, regulation, institutional issues, new security arrangements for preventing organized terrorist attacks, infrastructure design, vehicle design, operating protocols, and information systems.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PUBP 743 - National Security Management and Policy**

Credits: 3 (NR)
Examines hierarchies in national security from the president to military establishment, including National Security Council, secretary of defense, joint chiefs of staff, commanders-in-chief of unified and specified commands, and intelligence agencies. Covers policies involving national defense, peace-keeping operations, embargoes and other sanctions, defense conversion, and military acquisition policy. Also covers significant legislation affecting national security, such as National Security Act of 1947 and Goldwater-Nichols Act of 1986.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PUBP 744 - Federal Institutions and Management**

Credits: 3 (NR)
Covers management and policy in federal government, examining policy problems within context of national system of governance, including political environment, evolution and constitutional framework of American government, U.S. Congress, executive branch from White House to agencies, and role of interest groups and political parties. Special attention to implementing legislation, regulatory process, and intergovernmental relations.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**PUBP 745 - Transportation and the Environment**

Credits: 3 (NR)
Multidisciplinary examination of implications of transportation and ways public policy has attempted to handle them, and how
policy may move in the future. Explores all modes of transportation and most environmental ramifications.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 746 - Maritime Transportation Policy, Operations and Logistics

Credits: 3 (NR)  
Examines how international maritime transportation system has evolved, and discusses current challenges and options for future developments. Maritime shipping is an ancient enterprise that has dominated transportation since long before industrialization led to the development of steam propulsion, railroads, motor trucks, and airplanes. Topics include globalization, e-commerce, just-in-time manufacturing, quick response capabilities, integrated logistic systems, and relevance of maritime transportation in light of emerging technological advances.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 747 - Air Transportation Policy, Operations and Logistics

Credits: 3 (NR)  
Reviews evolution of various forms of air transport such as airlines, general aviation, and military aviation; and includes basics of airline economics, especially as they intersect with airline operations and the management of hub and spoke networks; air traffic control technologies and operations and their intersection with airline economics; safety and security technologies and regulations; future of various elements of air transportation; and effects of deregulation on air travel.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 748 - Public Transportation Policy, Operations and Logistics

Credits: 3 (NR)  
Provides general system description for components comprising typical publicly funded transit property. Topics include organizational structure, historical context, budget development including operating and capital budgets, personnel and labor relations, regulatory framework, operations management (bus and commuter rail), reporting structure, customer service, and contracted operations. Also discusses current topics of interest, such as security of transit systems and transit's role in air quality.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 749 - Highway Transportation Policy, Operations and Logistics

Credits: 3 (NR)  
Highways have played central role in development of U.S. transportation system. Interstate highway system has revolutionized both freight and passenger transport. Course examines history and development of highway system, institutions responsible for
development and ongoing operation, environmental impacts and efforts to mitigate them, the emerging emphasis on operations and management of highway system, and role in freight logistics and supply chain management system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 750 - History of Military Operations Other than War**

Credits: 3 (NR)  
Focuses on history of military activity in support of noncombat missions. Uses historical examples of early days of United States and colonial histories of Western and Eastern powers. Also touches on use of military force in support of multinational peace operations.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 751 - International Police Operations**

Credits: 3 (NR)  
Analyzes role of international police monitors and domestic police forces in international peace operations. Focuses on how using international police monitors and developing indigenous law-enforcement capabilities can improve prospects for success of international peace operations. Examines origins, mandates, planning, and deployment of international civilian police forces; problems of coordinating international police operations with international military forces and local security forces; international role in developing democratically oriented police forces; relationship of police to the entire judicial system; and the need to continue assistance to all parts of the judicial system beyond initial intervention.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 752 - Infrastructure Finance**

Credits: 3 (NR)  
Covers planning, budgeting, and financing of infrastructure, including air, water and surface transportation, public utilities, and other major public works. Focuses on private capital markets for projects funding as well as domestic and international loan and grant programs.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 753 - Ethics in Public Policy**

Credits: 3 (NR)  
Inquiry into ethical and moral issues in public policy. Explores issues that are controversial and often confusing to public policy makers such as health care, secrecy in government, surrogate motherhood, and disability. Perspectives are national as well as
global, and deal with impact of culture and politics on ethical dilemmas confronting society. Also looks at processes by which specific ethical systems are incorporated into governing bodies. Larger issues, such as war and peace, just and unjust wars, capital punishment, medical and legal ethics, and communitarian vs. individual liberties are also included, with emphasis on how they affect public policy.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 754 - Geographic Information Systems and Spatial Analysis for Public Policy**

Credits: 3 (NR)
Introduces GIS including analytical tools to manipulate and study spatial data. Run mainly as a laboratory, with extensive hands-on experience. Focuses on public policy applications.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 755 - National Security Decision-Making Policy**

Credits: 3 (NR)
Applies behavioral, economic, strategic, and other decision theories to U.S. government and other actors in historical national security crisis cases and current policy issues. Explores tension in decisions between rational goal seeking by actors vs. organizational process, and aims to develop usable decision tools.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 756 - Global Medical Systems Policy Analysis**

Credits: 3 (NR)
Equips students with knowledge and skills to critically analyze structures, functions, governing policies, and performance of healthcare systems; to identify problems and solutions; and to devise alternative courses of action and reform policies that would contribute to achieving goals. Prepares students in policy analysis rooted in systems analysis, while linking issues, objectives, and solutions with the larger context in which a system is embedded.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

**PUBP 757 - Public Policy in Global Health and Medical Practice**

Credits: 3 (NR)
Introduces international medical policy. Covers globalization of health and medical policies directed at removing disparities, financing, ethical considerations of biomedical research, and use of emerging technologies.
PUBP 758 - Global Threats and Medical Policies

Credits: 3 (NR)
Explores medical and health governance, biosecurity and biosafety, health and natural and human-made disasters, humanitarian and emergency assistance, vaccine development, behavior and health, critical infrastructures, bioethics and resource allocations in global context.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 759 - National Security Law and Public Policy

Credits: 3 (NR)
Introduces legal and policy issues concerning current U.S. national security. Its emphasis is on developments since 9/11. It focuses on the legal rules governing the formulation and execution of U.S. national security policy. It examines U.S. and international law as well as general domestic and foreign policy considerations. In particular, the course considers the principal cases, legislation and treaties impacting U.S. national security. Special emphasis is on the interplay of national security concerns and civil liberties in this age of global and transnational terrorism.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 760 - Science and Technology Policy in the 21st Century

Credits: 3 (NR)
Investigates roles dynamic scientific research and technological innovation play in contemporary society. Focuses on design and analysis of alternative public policies intended to influence rate and direction of technological change in societies, and use of scientific and technical knowledge in public policy making. Uses historical and international comparative approaches to assess politics and pragmatics of science and technology policy. Includes material from policy evaluation and analysis, organization theory, economics of innovation, and sociology of science and technology. Applications focus on areas of concern to "new economy" such as biotechnology, networked telecommunications and computing, and globalization of technology-based production.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 761 - Social Entrepreneurship and Public Policy

Credits: 3 (NR)
This course is about people who start new ventures with the explicit objective of creating social as well as private value. As
societies and the challenges they face become ever more complex, existing institutions and incentive structures may or may not be adequate to address new generations of problems. Social entrepreneurs innovate new organizational forms with the objective of finding solutions in the public interest. Students in this course will be challenged to integrate elements of business strategy and policy analysis toward the objective of crafting a practical plan for the launch of a novel and needed social venture.

PUBP 762 - Social Institutions and Public Policy

Credits: 3 (NR)
Limited government involvement in social policies changed drastically during the 1960s, with an explosion of social programs designed to ameliorate poverty, reduce crime, and eliminate racial segregation. These new social policies affect many institutions, including family, schools and colleges, criminal justice system, and government agencies. Many of these policies have been controversial, with debates over efficacy and whether they have cured or exacerbated social problems. Course examines evolution and status of selected American social policies, including civil rights policies, education reform, family policy, crime prevention, and other topics chosen by students. Readings and discussions on policy issues linked to readings and discussions on social theories and value systems that underpin social policies.

PUBP 763 - Illicit Trade

Credits: 3 (NR)
Examines the role that illicit trade assumes in international trade and commerce. Studies diverse international forms of illicit trade, the role that it assumes in perpetuating conflicts and the most pervasive forms of this illicit trade. Examines the actors who perpetrate this trade and the policies which are needed to stem its growth.

PUBP 764 - Transnational Crime and Corruption

Credits: 3 (NR)
Provides an overview of transnational crime and corruption and its effects on the political, economic, and social development of countries globally. Focuses on the growing problem of transnational crime in conflict regions. The course addresses the links among crime groups, corruption and terrorism. It analyzes diverse range of activities of transnational crime groups in both the legitimate and illegitimate economy.
PUBP 765 - Human Smuggling and Trafficking

Credits: 3 (NR)
Examines the rapidly growing phenomenon of human smuggling and trafficking. Addresses the reasons for the growth of these phenomena and their far-reaching and diverse social, political and economic consequences globally. Transnational crime dimensions of the problem are a central component of the class. The phenomenon is examined in conflict regions, developing, diverse developed as well as transitional societies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

PUBP 766 - Modern Counterinsurgency: Theory and Practice

Credits: 3 (NR)
This course is intended to give students a broad understanding of the nature of counterinsurgency, the policy implications of the U.S. becoming involved in an insurgency, and the multifaceted, interagency approach that is required to successfully combat an insurgency. The course includes case studies, a review of contemporary U.S. counterinsurgency practices, and insights on what the future might hold in this important type of conflict.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

PUBP 768 - Education and Public Policy

Credits: 3 (NR)
Explores current issues and policy initiatives in education policy at federal, state, and local levels, with emphasis on education reform. Issues and topics vary. Typical policy issues include raising academic standards, high-stakes testing, alternative governance including school choice and voucher policies, teacher quality and certification, role of school resources in academic outputs, and equity topics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 775 - Economics of Electronic Commerce

Credits: 3 (NR)
Focuses on gaining competitive advantage through electronic commerce implementation; identification and growing of new market opportunities and electronic enabling of existing business relationships; and business-to-consumer relationships and economics of strategic procurement, ERP hosting, customer relationship management, catalog hosting, portal operations, and supplier management.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**PUBP 777 - Critical Infrastructure Protection: Policy and Practice**

Credits: 3 (NR)
Design and implementation of high-speed network and application services in support of modern Enterprise Resource Planning (ERP) systems. Critical technologies include high-speed data communication, switched vs. routed data flow, workflow engines, business rule and web application servers, and load balancing technologies. Large-scale, web-enabled ERP system architecture examined in detail.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 780 - Evolution of the Washington Metropolitan Economy**

Credits: 3 (NR)
Includes historical context, role of federal spending, tourism, technology sector, international business, regional organizations, local government policies, and forecasts. Evaluates development patterns in Washington, D.C., Northern Virginia, and suburban Maryland.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 781 - Entrepreneurship and Economic Development**

Credits: 3 (NR)
A knowledge spillover theory of entrepreneurship is employed to link between theories of entrepreneurship and theories of innovation and regional development. Other interconnections are explored at the regional level as firms forge networks, clusters, and specialized markets. The public policy issues of these constructs, including competition policy, industrial policy, and cluster policy, are examined within a regional and global context.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 782 - International Financial Policy**

Credits: 3 (NR)
Addresses theory of international finance, application to financial policy such as exchange rate regimes, and institutions of international finance. Covers operations of International Monetary Fund and World Bank, development of European Monetary Union, and debate over "international financial architecture."

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**PUBP 783 - Global Governance**
Credits: 3 (NR)
Surveys important issues in global governance given changes in contemporary world. Explores dynamics and complexity of formal and informal actors, institutional arrangements, organizations, and roles in process of governance in international sphere. Considers states, governmental and nongovernmental organizations, international regimes, social movements, regional associations, and multinational corporations as actors bearing on transnational authority. Examines various vehicles for international coordination and conflict in terms of relevance and opportunities for global governance.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 784 - Entrepreneurship, Economics, and Public Policy

Credits: 3 (NR)
To demonstrate that global capitalism is a process driven by entrepreneurship, students study the Austrian school of economics, which views capitalism as a process of creative destruction, as well as other economists who emphasize entrepreneurship and change. The course reviews the history of capitalism, focusing on the so-called industrial revolutions in Britain, Germany, Japan, and the United States, and on particular historical and current entrepreneurs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 791 - Advanced Field Research for Policy: Theory and Method

Credits: 4 (NR)
Teaches how to analyze the framing of policy questions and examine culture and organization at group, organizational, interorganizational, and societal levels. Covers case study research, open-ended interviewing, participant-observation, social network analysis, and historical and archival research.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 792 - Advanced Economic Analysis for Policy Research

Credits: 4 (NR)
Builds analytical skills in economic analysis for policy research for students with competence in elementary calculus. Reviews mathematical techniques and covers consumer theory, demand estimation and forecasting, production theory, cost-benefit analysis, technological change and productivity analysis, growth theory, market structure and competition, game theory, capital budgeting, and public sector's role in the economy.

Prerequisite(s): PUBP 720 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 793 - Large-Scale Database Construction and Management for Policy Research
Explores data resources for macro-comparative policy research, and how to use these to inform decision making and evaluate policy performance. Emphasizes how social science data is generated, coded, and managed; and methods for successful presentation of evidence in support of policy recommendations.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 794 - Internship

Credits: 1-6 (RT)  
Open only to students in SPP degree program requiring internship. Contact appropriate program director one semester before enrollment. Work-study programs with specific employers.

**Prerequisite(s):** 12 PUBP credits, or permission of instructor.

**Notes:** Credit determined by appropriate degree program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit

### PUBP 795 - Final Project

Credits: 1-3 (NR)  
Writing of capstone paper related to student's program concentration, under guidance of three-person committee.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

### PUBP 796 - Directed Readings and Research

Credits: 1-3 (RT)  
Independent reading and research at master's or doctoral level on specific topic related to public policy as agreed to by student and faculty member.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### PUBP 799 - Master's Thesis

Credits: 1-6 (RD)  
Individualized section form required. Original research endeavor related to student's program concentration. Research must result
in document meeting public policy and university standards.

**Prerequisite(s):** Degree candidacy in public policy master's program; completion of required credits of graduate course work; and approval of thesis proposal by faculty advisor, two committee members, and program director.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

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**PUBP 800 - Culture and Public Policy**

Credits: 1-4 (NR)  
Comparative analysis of the role of culture in shaping policy environments and outcomes. Introduces analytical methods for studying culture, including measurement of social and cultural change, surveys, and field studies. Presents major findings and research issues regarding the role of culture in democracy, ethnic and gender relations, economic growth and other policy issues. Focuses on differences among national and regional cultures, and their policy implications.

**Hours of Lecture or Seminar per week:** 2-3  
**Hours of Lab or Studio per week:** 0-1

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**PUBP 801 - Research Design for Public Policy**

Credits: 1-4 (NR)  
Provides an introduction to the theory and practice of research in public policy. Gives students an understanding of issues in the philosophy of science and different approaches to social science research. Provides broad overviews of quantitative and qualitative methodologies, with a major emphasis on research design, including conceptualization, the role of theory, hypothesis generation, inference and bias.

**Prerequisite(s):** PUBP 720 and PUBP 730, or their equivalents strongly recommended.

**Hours of Lecture or Seminar per week:** 2-3  
**Hours of Lab or Studio per week:** 0-1

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**PUBP 802 - The Logic of Policy Inquiry**

Credits: 1-4 (NR)  
Defines policy research problems, questions, and hypotheses. Explores modes of policy research, analysis, and rhetoric, including interdisciplinary research strategies. Uses information sources to emphasize written communication of policy research results. Also discusses professional practice issues.

**Prerequisite(s):** Enrollment in doctoral program in public policy.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
PUBP 804 - Multivariate Statistical Analysis in Public Policy

Credits: 4 (NR)
Explores multivariate techniques of contingency table analysis, reliability and validity assessment, factor analysis and scaling, multivariate regression and path analysis, analysis of variance and covariance, and other selected multivariate techniques. Emphasizes applying these techniques to real policy data using sophisticated statistical packages.

Prerequisite(s): PUBP 704 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 805 - Foundations of Social Science for Public Policy

Credits: 4 (NR)
Grounds doctoral students in core concepts of political science and economics through critical analysis of classic sources, old and new. Topics may include theory of the state, state-market relations, democratic governance, markets and economic institutions, and other relevant frameworks for public policy research.

Prerequisite(s): PUBP 730 or equivalent.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

PUBP 806 - Advanced Management Science for Public Organizations

Credits: 3 (NR)
Primary emphasis is to understand techniques of operations research and management science, cost benefits, and cost effectiveness for public policy decision making. Some familiarity with elementary calculus and linear algebra helps with understanding mathematical basis of algorithms used to solve models, and reliability and validity of these techniques. Case studies and computer solutions help students understand when and how to use OR models.

Prerequisite(s): PUBP 712 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 810 - Regional Development and Transportation Policy

Credits: 4 (NR)
Introduces and critiques theory and methods used in regional and transportation policy analysis. Explores central place, growth pole, and economic base theories as well as other theoretical constructs used in regional policy analysis. Introduces and examines methodological tools such as regional econometric modeling, multiobjective programming, shift-share analysis, economic base analysis, location quotient analysis, and input-output analysis. Examines selected regional and transportation public issues using theoretical and methodological constructs introduced in first part of course.
PUBP 811 - Applied Methods in Regional Development and Transportation Policy

Credits: 4 (NR)

Students develop research papers that investigate aspects of regional and transportation policy, with the goal of producing publishable papers. Students develop the focus of their paper based on work done in the first semester, and are expected to prepare a two-page proposal followed by a detailed proposal and finally, a completed paper. Each is critiqued in the seminar, which is organized to conform to the process of review and critique. Instructor works with students individually as well as in seminar sessions.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 0-1

PUBP 817 - Policy Research Topics: Transportation Policy

Credits: 3 (NR)

Research workshop examining the development of policy research and relevant methodologies linked directly to faculty and student interests. Students identify cutting-edge policy concerns and execute research programs. The 4-credit version of the course requires a discussion section and research laboratory.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 0-1

PUBP 820 - Technology, Science, and Innovation: Institutions and Governance

Credits: 4 (NR)

First of the two-semester core seminar sequence required for public policy PhD students in the science and technology policy concentration. Explores how political and economic institutions and cultural values shape pace, direction, costs, and benefits of technological innovation and scientific research. Special emphasis on the interaction between national institutions, and values and processes of globalization.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 0-1

PUBP 821 - Analytic Methods for Technology, Science, and Innovation Policy

Credits: 4 (NR)

Second of the two-semester core seminar sequence required for public policy PhD students in the science and technology policy concentration. Covers major methodological approaches to the study of technology, science, innovation, and public policy. Focuses on analytical inputs to policy making, and assesses practical consequences in such areas as security, energy, environment, and health.
**PUBP 830 - Comparative Socioeconomic Policy**

Credits: 1-4 (NR)
Throughout the past century, numerous socioeconomic theories have competed for primacy. This course compares, contrasts, and analyzes some of the leading socioeconomic theories and policies and places them in a global context. The role of these theories in shaping current public policy is explored.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 833 - Topics in Public Policy**

Credits: 1-4 (RT)
Focuses on selected topics in public policy not covered in fixed-content public policy courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 834 - Entrepreneurship, Growth, and Public Policy**

Credits: 1-4 (NR)
Focuses on a closer consonance among entrepreneurship, geography, and economic growth. Studies the creation and incubation of new knowledge and features three theoretical fields: the new growth theory; the new economic geography; and the new economics of innovation. Develops a knowledge spillover theory of entrepreneurship. Examines public policy issues arising from these constructs, including competition, within a regional and global context.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**PUBP 835 - Entrepreneurship, Creativity, and Innovation**

Credits: 1-4 (NR)
Provides multidisciplinary foundation for the study of entrepreneurship, creativity, and innovation, and their effects on regional and national economic growth. Draws from seminal thinkers and emphasizes creativity and innovation. Examines how organizational change, institutional structure, and geographic clustering drive the development of regional and national economies. Explores these issues through the lens of the three Ts of economic growth: technology, talent, and tolerance.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
PUBP 840 - U.S. Policy-Making Institutions

Credits: 4 (NR)
First of two-semester sequence in governance and public management policy concentration. Examines major institutions that formulate and implement policy at national level. Emphasizes presidency, Congress, and executive branch bureaucracies. Also considers agenda-building institutions such as media, interest groups, political parties, and elections.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 0-1

PUBP 841 - U.S. Policy-Making Processes

Credits: 4 (NR)
Second of two-semester sequence in governance and public management policy concentration. Analyzes major U.S. Public policy processes. Attention to major instruments for implementing policy, including regulation, grants, tax policy, and market-based mechanisms; and how different methodologies are appropriate for understanding aspects of policy inquiry. Covers ethical and accountability aspects of policy, including federalism, intergovernmental relations, and state and local governance.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 0-1

PUBP 850 - Seminar in Public Policy

Credits: 1 (RT)
Weekly colloquium series, required of public policy PhD students. Features variety of speakers from universities, government, and nonprofit sectors. Topics include policy formulation and analysis, and theoretical and methodological foundation.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

PUBP 860 - Social Theory, Culture, and Public Policy

Credits: 4 (NR)
Covers major social and cultural theories that underlie public policies. Selections from classical and contemporary social theorists relevant to studying social change, social capital, and social organization. Focuses on interplay among culture, social institutions, social processes, and policy.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 0-1

PUBP 861 - Culture and Social Policy Analysis
Credits: 4 (NR)
Applies social and cultural theories to policy topics, including methodological approaches and empirical studies. Emphasizes linkage between theory and empirical research, and methods appropriate for social policy study. Policy topics may include poverty and inequality, family, education, crime and corruption, immigration, and health.

Hours of Lecture or Seminar per week: 2-3
Hours of Lab or Studio per week: 0-1

PUBP 862 - Institutional Analysis and Policy

Credits: 4 (NR)
Policy analysts are increasingly cognizant of the influence of societal institutions in shaping public policy, not only in terms of policy design, but also as a determinant of implementation. This course reviews the growing literature regarding institutional analysis; furthermore, it considers the ways in which institutions help shape the policies that emerge within a given society and the context by which they are evaluated.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 870 - Organizational and Policy Aspects of Informatics

Credits: 1-4 (NR)
Examines effects of informatics on national and international policy; setting international policy on informatics; ethical and social change in governments and organizations; shaping national policy in informatics; industry growth; and research methods from various scientific disciplines.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 871 - Organizational and Information Technology Challenges of the Knowledge Society

Credits: 4 (NR)
Explores links of policy, managing organizations, and information technologies in postmodern era. Includes issues related to contradictions among conventional models of organizational and process design, policy and regulatory structures, ideologies, and information technologies. Provides framework for becoming more sophisticated analyst of policy, organizations, and information technology.

Prerequisite(s): PUBP 870.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 872 - Managing Knowledge-Based, Information-Intensive Organizations
Credits: 4 (NR)
Deals with challenges of planning, creating, integrating, and managing contemporary information-technology enabled public and private sector organizations, and managing relationships between public and private enterprises enabled by information technology initiatives.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 880 - Global and International Public Policy I

Credits: 4 (NR)
Explores multiple dimensions of globalization and internationalization relative to public policy processes and consequences. Offers substantive insight into contemporary public policy dynamics from global and comparative perspectives. Accordingly, it examines a broad range of international cultural, political, technological, and economic policy issues, and their interactions and implications at all levels of analysis. Engages relevant theoretical and methodological approaches and debates to provide tools for analyzing various world problems and policies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 881 - International Trade Policy

Credits: 4 (NR)
Addresses international trade theory, trade policy analysis, regional economic integration, and institutional arrangements governing world trade. Covers World Trade Organization (including constituent agreements in goods, services, intellectual property and trade-related investment measures), regional trade agreements such as NAFTA, dispute settlement regimes, and relations between trade and the environment.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

PUBP 997 - Field Statement

Credits: 1 (NR)
Requires work on field statement in preparation for field exam.

Prerequisite(s): Permission of field committee chair.

Notes: Must register in semester during which field exam will be taken. May not be repeated. Does not apply to credit degree requirements.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
PUBP 998 - Research/Proposal for Dissertation

Credits: 1-9 (RD)
Requires work on research proposal that forms basis for doctoral dissertation.

Prerequisite(s): Permission of instructor. Contact program coordinator for approval and CRN to register via PatriotWeb.

Notes: May be repeated, but no more than 24 credits of PUBP 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

PUBP 999 - Dissertation

Credits: 1-9 (RD)
Requires research on approved dissertation topic under director on dissertation committee.

Prerequisite(s): Permission of instructor.

Notes: May be repeated, but no more than 24 credits of PUBP 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

Real Estate (REAL)

Offered by the School of Management

REAL 500 - Real Estate Development Fundamentals

Credits: 3 (NR)
A comprehensive study of the main elements of the real estate development process. Examines the intricacies between residential, commercial and mixed-use development, and approaches to optimizing each. The value of market research and analysis, determining value propositions of prospective deals, zoning considerations, design and construction issues, and asset management will also be examined.

Prerequisite(s): Graduate standing

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REAL 502 - Real Estate Client Leadership and Project Management
Credits: 3 (NR)
A study of the challenges faced by developers, both in terms of client (owner) challenges as well as project challenges. Examines assessment approaches and frameworks to assess clients, including analyzing the maturity of a representative client and identify key approaches to optimizing the relationship of that client. Examines specific project challenges-project assessment frameworks, and improvement approaches.

Prerequisite(s): Graduate standing, REAL 500 (or CEIE 580), or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REAL 630 - Innovative Land Use, Approvals and Real Estate Development

Credits: 3 (NR)
Examines the challenges in designing innovative uses for land and balancing those prospective uses with local urban policies and the land development/zoning process. Introduces the entitlements process, the legal considerations of planning and zoning in America, and the language of zoning. Explores the impacts of the different forms of government on the entitlement process.

Prerequisite(s): Admission to the MSRED program or permission of the program director.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REAL 690 - Topics in Real Estate Development

Credits: 1-6 (RD)
Explores contemporary issues and challenges in the management and development of real estate. Topics not covered in the regular real estate development offerings. Course content may vary each semester. Course may be repeated with change in topic.

Prerequisite(s): Admission to the MSRED Program or permission of the program director.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

REAL 750 - MSRED Capstone

Credits: 3 (NR)
The Capstone Project will be the culmination of the master's program, offered at the end of the program. The course will combine the theoretical teachings from the program with real world, practical situations. Students will apply concepts learned to current development and construction projects in the Washington, D.C. metropolitan area. One of the sample cases involves the potential future uses of a plot of land in the metro area, a mixed-use high-density area that is slated to undergo significant transformation. The case will request project teams to explore the various options, employing a decision-tree approach to fully analyze the options, and examining the SWOT, local urban management policies, future valuation streams, and environmental impacts of each. A site visit will be required, as well as visits to various developers engaged in similar projects.

Prerequisite(s): Admission to the MSRED Program or permission of the program director.
REAL 796 - Directed Reading

Credits: 1-6 (RD)

Admission to the MSRED program or permission of the program director.

Prerequisite(s): Admission to the MSRED program or permission of the program director.

Reading Education (EDRD)

Offered by the College of Education and Human Development

EDRD 300 - Literacy and Curriculum Integration

Credits: 3 (NR)
Introduces K-12 content area reading, writing, and language arts. Emphasizes integration of reading and other language arts across curriculum.

Notes: Intended as an introduction to educational issues and is not applicable in Mason's graduate-level teacher education programs. School-based field experience required.

EDRD 301 - Facilitating Literacy in School or Community Settings

Credits: 3 (NR)
Provides knowledge, teaching strategies, and support for students working with developing readers and writers. Emphasizes implementation strategies that foster literacy development; incorporation of trade books and technology resources into individual and small group work; and reflection.

Notes: Requires 45 hours of school-based field experience during course.
EDRD 419 - Literacy in the Content Areas

Credits: 3 (NR)
Assists students in understanding the language and literacy process as it applies to teaching in middle and high schools. Focuses on instructional strategies to support literacy development, including adaptations for culturally diverse and exceptional learners.

Prerequisite(s): EDCI 473 and EDCI 483.

Corequisite(s): EDCI 490.

EDRD 500 - In-Service Educational Development

Credits: 1-6 (RT)
Offered at request of school division or other educational agency.

Notes: Content varies; may be repeated for credit.

EDRD 501 - Literacy and Curriculum Integration, PK-12

Credits: 3 (NR)
Introduces PK-12 content area reading, writing, and language arts. Emphasizes integration of reading and other language arts across curriculum; instructional planning; needs of diverse learners. Field experience in public schools required.

EDRD 525 - Emergent Literacy for English Language Learners, PK-12

Credits: 3 (NR)
Provides an introduction to emergent reading/writing processes in first and second languages. Focuses on developing reading skills in five areas: phonemic awareness, phonics, fluency, vocabulary, and text comprehension.

Prerequisite(s): EDCI 510, EDCI 516, or Permission of Instructor
EDRD 558 - Literacy in the Content Areas, PK-12

Credits: 3 (NR)
Focuses on research-based introduction to PK-12 content area reading, writing, and language arts that meet state and national guidelines. Enables teachers to understand literacy needs of their students in content areas, and provide appropriate instruction.

EDRD 597 - Special Topics in Education

Credits: 1-6 (RD)
Provides advanced study on selected topic or emerging issue in American or international education.

Notes: May be repeated for credit with GSE permission.

EDRD 610 - Content Literacy for English Language Learners, PK-12

Credits: 3 (NR)
Focus on research-based instruction for teaching reading and writing in the content areas. Emphasizes similarities and differences between reading and writing in two or more languages, vocabulary development, reading fluency, and strategies for text comprehension.

Prerequisite(s): EDRD 525 or Permission of Instructor

EDRD 614 - Teaching Reading in the Secondary School

Credits: 3 (NR)
Emphasizes reading and writing in content areas; reading and writing causes, classroom diagnosis, and remediation of reading problems; study skills; and rates of reading.

EDRD 615 - Reading/Writing for Multilingual Students

Credits: 3 (NR)
Develops instructional competencies in reading and writing approaches for students from culturally and linguistically diverse backgrounds. Examines teaching reading and writing across curriculum, biliteracy acquisition, historical and current approaches for second language learners, preliteracy skills for younger and older English language learners, and special issues in developmental and diagnostic reading for language minority students.

Prerequisite(s): EDCI 516 and 519, or permission of instructor or advisor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDRD 619 - Literacy in Content Areas

Credits: 3 (NR)
Offers understanding of language and literacy process as it applies to teaching in secondary schools. Emphasizes reading and writing in content areas, and instructional strategies to support students' literacy development. Focuses on ways reading, writing, speaking, and listening are developed and used in learning discipline-specific curriculum, including adaptations for culturally diverse and exceptional learners.

Prerequisite(s): Methods I (EDCI 567, 569, 572, or 573) and Methods II (EDCI 667, 669, 672, or 673).

Corequisite(s): EDCI 790 Internship.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDRD 620 - Reading/Writing in Foreign/World Languages

Credits: 3 (NR)
Introduces reading and writing processes in foreign and second languages, research on reading comprehension, and effective teaching and assessment approaches for students in PK-12 schools. Topics include reading goals and standards for foreign language learning, sociocultural perspectives, multimedia computer-assistance, research on related strategies and skills, and performance-based assessments.

Prerequisite(s): EDCI 516 and 519, or permission of instructor or advisor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDRD 630 - Advanced Literacy Foundations and Instruction, Birth to Middle Childhood

Credits: 3 (NR)
Advanced study of literacy theory, research, and practice as it relates to younger learners. Addresses sociocultural, cognitive,
linguistic, psychological, and developmental influences on children's literacy. Includes reading, writing, and oral communication.

**Prerequisite(s):** Admission to the literacy emphasis, or permission of program coordinator.

**EDRD 631 - Advanced Literacy Foundations and Instruction, Adolescence through Adulthood**

Credits: 3 (NR)
Advanced study of literacy theory, research, and practice as it relates to adolescents and adults. Addresses sociocultural, cognitive, linguistic, psychological, and developmental influences on literacy. Includes reading, writing, and oral communication.

**Prerequisite(s):** EDRD 630 and admission to the literacy emphasis, or permission of program coordinator.

**EDRD 632 - Literacy Assessments and Interventions for Groups**

Credits: 3 (NR)
Provides literacy assessments and interventions for groups of learners. Includes exploration of assessment tools for classrooms and large populations. Class members conduct related practice in their own classrooms or specified field settings.

**Prerequisite(s):** EDRD 630 and 631; admission to literacy emphasis, or permission of the program coordinator.

**EDRD 633 - Literacy Assessments and Interventions for Individuals**

Credits: 3 (NR)
Provides literacy assessments and interventions for individuals. Includes diagnosis and remediation for learners who find reading and writing difficult. Requires assigned practicum experience.

**Prerequisite(s):** EDRD 630, 631, and 632; admission to literacy emphasis; or permission of program coordinator.

**EDRD 634 - School-Based Leadership in Literacy**
Prepares reading specialist as a school leader. Expands knowledge of literacy gained in prerequisite courses, and applies it to professional development work with teachers at their own site.

**Prerequisite(s):** EDRD 630, 631, 632, and 633; admission to literacy emphasis or permission of program coordinator.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDRD 635 - School-Based Inquiry in Literacy**

Credits: 3 (NR)  
Capstone course in literacy emphasis focusing on research-based inquiry related to literacy in school settings. Includes review of literature and teacher inquiry project.

**Prerequisite(s):** EDRD 630, 631, 632, 633, and 634; admission to literacy emphasis; or permission of program coordinator.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDRD 637 - Supervised Literacy Practicum**

Credits: 2-3 (NR)  
Supervised literacy practicum that requires students to conduct assessments of and provide instruction to struggling readers.

**Prerequisite(s):** EDRD 630, 631, 632  
**Corequisite(s):** EDRD 633.

**Hours of Lecture or Seminar per week:** 2-3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special

**EDRD 658 - Advanced Reading Methods and Language Acquisition, Elementary**

Credits: 3 (RD)  
Provides research-based introduction to literacy for children in grades K-6. Emphasizes oral language, reading process, literacy development, integration of reading across the curriculum, culture connections, and families and literacy.

**Prerequisite(s):** EDRD 558

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDRD 797 - Advanced Topics in Education**
Credits: 1-6 (RD)
Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.

Notes: May be repeated for credit with CEHD approval.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDRD 829 - Advanced Foundations of Literacy Education

Credits: 3 (NR)
Examines foundational theory, research, and methodology related to literacy. Includes historical and theoretical foundations; research methodologies; and issues such as literacy acquisition, beginning reading, comprehension, struggling readers, and language diversity.

Prerequisite(s): EDUC 800, EDRS 810, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDRD 830 - Foundations of Literacy: Birth through Later Childhood

Credits: 3 (NR)
Explores theory, research, and practice related to emergent literacy and literacy development during childhood. Topics include literacy acquisition and development; historical trends in theories of literacy development; psychological and linguistic, sociocultural, and instructional influences on literacy development; vocabulary development; role of narrative and scripts on linguistic development; authentic tasks and assessment and early literacy; and development in academically diverse children.

Prerequisite(s): EDUC 800 and EDRS 810.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDRD 831 - Foundations of Literacy: Adolescence through Adulthood

Credits: 3 (NR)
Explores theory, research, and practice related to adolescent and adult literacy. Topics include influences on adolescents' and adults' literacy practice and development, current and historical understanding of literacy, connections between literacy and learning in the content areas, and needs of diverse learners. Students review common core research literature and topics of individual interest.

Prerequisite(s): EDUC 800 and EDRS 810.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDRD 832 - Seminar in Emerging Trends and Issues in Literacy

Credits: 3 (NR)
Explores emerging trends and issues related to literacy research methods, processes, practices, and policies. Students analyze literacy research and develop a research proposal on a topic of personal interest.

Prerequisite(s): EDUC 800, EDRS 810, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

Religious Studies (RELI)

Offered by the College of Humanities and Social Sciences

RELI 100 - The Human Religious Experience

Credits: 3 (NR)
Examines main forms of religious expression as embodied in several important religious traditions in contemporary world. Investigates religious experience; myth and ritual; teachings and scripture; ethical, social, and artistic aspects of religion; and nature and function of religion in human society.

Fulfills general education requirement in global understanding.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 110 - Introduction to Jewish Ethics

Credits: 3 (NR)
Brief overview of Judaism and its classical texts. Examines a number of current ethical issues including artificial insemination, stem cell research, transplantation, abortion, homosexuality, capital punishment, from a Jewish perspective.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 211 - Religions of the West

Credits: 3 (NR)
Focuses on Judaism, Christianity, and Islam from historical, comparative, and cross-cultural perspectives. May also include modern developments of those faiths such as Mormonism and Baha'ism, as well as Zoroastrianism and religions of ancient Near Eastern cultures.
Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**RELI 212 - Religions of Asia**

Credits: 3 (NR)
Surveys religions of India, Hinduism, Jainism, Sikhism, Buddhism, and the religions of the Far East, China, and Japan, including Daoism, Confucianism, Shinto, from origins to present.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**RELI 235 - Religion and Literature**

Credits: 3 (NR)
Explores the relationship between religion and literature in different times and cultures, the influence of religion on literary works, and how literature expresses major religious themes such as death and immortality, divine will and justice, suffering and human destiny, and religion and state.

Fulfills general education requirement in literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**RELI 272 - Islam**

Credits: 3 (NR)
Introduces basic religious beliefs and practices of Islam, with view to diverse manifestations of Islamic culture in different ethnic and social contexts. Provides overview of essential rituals of Islamic life, mystical practices of Sufis, certain popular forms of religious practice, sources and application of Islamic law, and distinctive Islamic artistic and literary forms.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**RELI 313 - Hinduism**
Credits: 3 (NR)
Introduces Hindu religion and thought, beliefs, rituals, ethics and religious practices. Emphasis on classical Hinduism, but also covers Hinduism and modernity, modern Hindu movements, and Hinduism as a global religion.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

REL 314 - Chinese Philosophies and Religious Traditions

Credits: 3 (NR)
Surveys major religious traditions and philosophical themes of China including Confucianism, Taoism, and Chinese Buddhism and Neo-Confucianism. Examines foundation of Chinese world view and spirituality by investigating diverse religious traditions that have created tensions and harmony among them.

Prerequisite(s): RELI 212, or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

REL 315 - Buddhism

Credits: 3 (NR)
Surveys Buddhist religious traditions. Includes historical development of Buddhism in India, China, and Japan, examining both Theravada and Mahayana traditions; philosophical and religious significance of Buddhism; and social and political implications of Buddhist traditions in South Asian and East Asian countries.

Fulfills general education requirement in global understanding.

Notes: Fulfills the college requirement in non-Western culture.

REL 316 - Christian Thought and Practice

Credits: 3 (NR)
Surveys origins and development of Christian beliefs, rituals, ethics, and religious practices. Emphasizes various expressions of these in different time periods, societies, and cultures.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
RELI 317 - Daoism

Credits: 3 (NR)
Explores philosophical ideas, spiritual orientation, religious practice, and social and political values in Daoist tradition reading classic Daoist texts including Dao De Jing, Chuang-tzu, and other sources. Discusses Daoism in light of comparative and cross-cultural studies for global understanding of issues on concepts of nature, human nature, and good and evil.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 330 - Religion, Fantasy and Imagination

Credits: 3 (NR)
Explores the worlds of religion, fantasy and imagination, presented in selected writings of 20th century fantasy authors, including Lewis, Tolkien, Pullman, Rowling. Covers ideas of quest for enlightenment, redemption or salvation, conflict between good and evil, worlds of the supernatural, parallel dimensions and their inhabitants.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 331 - Religion in America

Credits: 3 (NR)
Religious heritage in American culture, growth of denominations and sects, and interrelationship of religion and sociopolitical life.

Equivalent to RELI 231 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 337 - Mysticism: East and West

Credits: 3 (NR)
Comparative treatment of major expressions of mysticism in East and West through exploration of various ways of understanding mystical experience. Readings and discussion emphasize one or more of the Eastern (Hinduism, Buddhism, Taoism, Zen) and Western (Judaism, Christianity, Islam) traditions.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
RELI 341 - Global Perspectives on Spirituality and Healing

Credits: 3 (NR)
Cross-cultural investigation of human understandings of relationship between spirituality and health. Beliefs about spiritual causes of sickness and health and spiritual techniques of healing in variety of world cultures placed in context of religious beliefs of those cultures.

Fulfills general education requirement in global understanding.

Prerequisite(s): 30 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 350 - Religion and History of Ancient Israel

Credits: 3 (NR)
Examines religion and history of ancient Israel from origins around 1250 BCE to Babylonian Exile in 587 BCE. Topics include debate on historical value of biblical narratives, extra-biblical texts mentioning Israel, move from polytheism to monotheism, archaeology and artifacts, and development of Israel's unique religious and historical self-understanding.

Prerequisite(s): RELI 211, or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 352 - Judaism from Exile to Talmud

Credits: 3 (NR)
Examines Jewish religion, history, and literature from the Babylonian Exile to third century C.E. Special attention to development of Hebrew Bible, Apocalyptic and Apocryphal literature, belief in resurrection and final judgment, Dead Sea Scrolls, Jewish sects, and emergence of Christianity and Rabbinic Judaism.

Prerequisite(s): RELI 211, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 353 - Jewish Political Tradition

Credits: 3 (NR)
Explores Jewish thinkers' attitudes towards politics and state. Topics include traditional sources, theological and political crisis of modern times, liberal Jewish thought, Zionist ideology, Israel as a separate state, relationship between religion and politics in modern Israel.
**RELI 354 - Topics in Modern Jewish Thought**

Credits: 3 (NR)
Surveys modern Jewish thought, engaging some of the most important themes of this period including Jewish responses to rationalism, romanticism, idealism, existentialism, and legalism. Studies work from Baruch Spinoza to Emanuel Levinas.

Equivalent to PHIL 354

Prerequisite(s): 3 credits in religious studies or philosophy or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**RELI 355 - Sufism**

Credits: 3 (NR)
Examines the tradition of Islamic mysticism, Sufism, through an exploration of the literature produced by Sufis themselves. Provides a general introduction to Sufism and its spiritual perspective and investigates various genres of Sufi literature, including hagiography, symbolic scriptural exegesis, spiritual autobiography, didactic allegory and love poetry.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**RELI 356 - Jesus and the Gospels**

Credits: 3 (NR)
Examines Gospel accounts of Jesus in context of first-century Christianity. Applies variety of historical and literary methods to gain understanding of Jesus and history and theology of early church.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**RELI 357 - Gender and the Body in Judaism**

Credits: 3 (NR)
Explores distinctively Jewish approaches to questions of gender, sexuality, and the body as described in the legal, religious, ethical, and literary material in the Jewish tradition. Topics include the "body of God," circumcision, laws of purity, rites of passage, the synagogue, feminist theology, and masculine and feminine stereotypes.
REL 359 - Muslims in the United States

Credits: 3 (NR)
Introduces Islam in the United States past and present. Includes arrival of African Muslims slaves, the emergence of Muslim groups in the early 20th century, and the larger-scale Muslim immigration from the 1960s to the present. Topics include religious practice, media representations, political participation, institution, and cultural production.

REL 360 - Religion and Politics

Credits: 3 (NR)
Explores the roles of religion in contemporary political life in the United States and abroad. Emphasizes religion in current political debates. Includes history, political theory, sociology, and theology to present a comprehensive understanding of the topic.

REL 361 - Evangelical America

Credits: 3 (NR)
Introduces the intellectual and social sources of evangelical Protestant traditions in the United States. Examines varieties of evangelical beliefs and practices. Surveying a range of themes, including science, sexuality, politics, and environmentalism, students examine how evangelicals have defined themselves in opposition to secular society but also have engaged the secular in an effort to convert souls, manage personal behavior, and transform American society in their image of Christian community.

REL 362 - Religion and Film

Credits: 3 (NR)
Surveys representations of religious beliefs, practices, persons, and institutions in popular film. Focuses on the media consumption of box office movies in the United States. Examines how religion is imaged in film and how that religious imagination relates to social constructions of national, ethnic, racial, gender, and sexual identities.
REL 363 - Catholicism

Credits: 3 (NR)
Focuses on the beliefs of the over one billion Roman Catholics in today's world. Probes the history, doctrine, symbols, rituals, practices, and material culture of the world's largest church. Considers Catholicism's dialog with secularism and discusses controversies and challenges facing the church today.

Prerequisite(s): 3 credits in religious studies or philosophy or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REL 364 - Religion and Law in the United States

Credits: 3 (NR)
Explores issues relating to law and religion. Focuses on the legal doctrines that have arisen in cases under the Establishment and Free Exercise Clauses of the First Amendment. Topics include religion and public schools, government aid to religious institutions, including school vouchers, government endorsement of religious symbols, freedom of religious expression, and freedom of religious practice.

Prerequisite(s): 3 credits of religious studies or philosophy or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REL 370 - Judaism

Credits: 3 (NR)
Studies Judaism from origins to present. Includes origins of Judaism B.C.E.; Rabbinic Judaism; Jews in the Middle Ages; Hasidic and Mystical Judaism; Enlightenment; persecution and Holocaust; contemporary American Judaism; and Jewish, Christian, and Muslim relations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REL 371 - Classic Jewish Texts

Credits: 3 (NR)
Jewish life and practice have always been centered on ongoing interpretation of classic texts, such as Tanakh ("Old Testament"), Talmud (Oral Law), Midrash (readings of the Bible) and the Kabbalah (mystical teachings) Course provides survey and introduction to major texts of Judaism.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
RELI 372 - American Judaism

Credits: 3 (NR)
Surveys Jewish religious life focusing on various types of American Judaism such as orthodox, conservative, reform, reconstructionist, as they have developed historically and continue to evolve. Emphasizes issues and challenges facing contemporary Judaism.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 374 - Islamic Thought

Credits: 3 (NR)
Examines Islamic views on fundamental issues in religious thought, such as nature of God, nature of man, and relationship between God and man as reflected in both divine revelation and human religious vocation. Investigates intellectual approaches to these problems within Islamic tradition, including those of theological, philosophical, and mystical thinkers.

Fulfills general education requirement in global understanding.

Prerequisite(s): RELI 211, 3 credits in religious studies, or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 375 - Qur’an and Hadith

Credits: 3 (NR)
Explores two primary sources of Islamic belief and practice: Qur’an and Hadith. Discusses thematic structure and literary quality, and examines theological and moral issues. Also introduces various methods of interpretation and critical analysis applied to texts in both Islamic and Western scholarship. Lecture and discussion.

Prerequisite(s): 3 credits in philosophy and religious studies, or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 376 - Special Topics in Religious Thought

Credits: 3 (RT)
Selected topics from a philosophical perspective.

Prerequisite(s): 3 credits in philosophy or religious studies, or permission of instructor.
RELI 377 - Special Topics in Religious Thought

Credits: 3 (NR)
Selected topics from a philosophical perspective.

Prerequisite(s): 3 credits in philosophy or religious studies, or permission of instructor.

RELI 381 - Beginnings of Christianity

Credits: 3 (NR)
Examines early Christian church from time of Jesus to 700 C.E. Covers internal development of Christianity as it formed official doctrines and institutions, and external relations of Christians with followers of other religions in Roman Empire. Special attention to reasons for success of Christianity in Roman world.

RELI 401 - Death and the Afterlife in World Religions

Credits: 3 (NR)
Examination of the rituals, practices, and beliefs regarding death and the afterlife in world religions past and present. Emphasis placed on crosscultural and comparative aspects.

Prerequisite(s): 60 credits including 6 credits in religious studies or permission of instructor

RELI 403 - Scripture and Authority in World Religions

Credits: 3 (NR)
Examines origins, development, and role of Scripture (religious texts) in world religions, concentrating on issues of divine inspiration, authority, authenticity, and canon.

Prerequisite(s): 60 credits including 6 credits in religious studies, or permission of instructor.
RELI 405 - Religion, Values, and Globalization

Credits: 3 (NR)
Explores diverse value systems, ethical norms, and teaching found in different religious traditions and cultures. Examines assumption that globalization is attempt to universalize Western culture.

Prerequisite(s): 60 credits including 6 credits of religious studies, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 407 - Women in the World's Religions

Credits: 3 (NR)
Seminar course offering theoretical and comparative study of role of women in six of the major religious traditions of the world—Judaism, Christianity, Islam, Hinduism, Buddhism, and Chinese religions.

Prerequisite(s): 60 credits; 6 credits of philosophy or religious studies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 420 - Seminar

Credits: 3 (RT)
Senior seminar on a specific topic of relevance to religious studies. Content varies.

Fulfills writing intensive requirement in the major.

Prerequisite(s): Major in religious studies with 60 credits including 9 credits or permission of instructor.

Notes: May be repeated three times when topic varies. Students with other majors may be take the course if the topic is sufficiently close to their field of study.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 425 - Directed Readings in Religious Studies

Credits: 1-3 (RD)
Individual readings and research in religious studies on a topic selected in consultation with instructor.
Prerequisite(s): Major in religious studies with 60 credits including 9 credits in religious studies.

Notes: May be repeated for a total of 6 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 490 - Comparative Study of Religions

Credits: 3 (NR)
Cross-cultural examination of comparative aspects of religious phenomena. Examines significance of religious phenomena from diverse religious and cultural perspectives, and investigates patterns of religious phenomena that have appeared in world cultures and civilizations.

Fulfills general education requirement in synthesis.

Prerequisite(s): 9 credits in religious studies including RELI 211 and RELI 212, or permission of instructor.

Notes: Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 591 - Special Topics in Religious Studies

Credits: 3 (RT)
Topics in religious studies selected by importance in the field and pertinent to the role of religion in society and culture. Emphasis on historical, interdisciplinary, and cross-cultural issues.

Notes: May be repeated for a maximum of 12 credits when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RELI 630 - Approaches to the Study of Religion

Credits: 3 (NR)
Examines study of religion as academic discipline. Evaluates various intellectual approaches and methods used in study of religious phenomena.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
REL 631 - Sacred as Secular in Modern Spirituality

Credits: 3 (NR)
Investigates nature of sacred and categories of sacred and secular in human experience. Both duality and interconnectedness of sacred and secular explored to facilitate fresh understanding of essential unity of human religiosity and spirituality.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REL 632 - World Religions in Conflict and Dialogue

Credits: 3 (NR)
Explores reasons for instances of global religious conflicts and examines ways of engaging in interreligious dialogue. Investigates religious pluralism as an effective means for dialogue.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REL 633 - Ethical Perspectives of World Religions

Credits: 3 (RD)
Examines how perceptions of ultimate reality shape ethical values and behaviors of various religious traditions. Addresses problems in interpretation of authoritative foundational teachings in contemporary contexts. Special attention to non-Western religions.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

REL 635 - World Religions in Transition and Transformation

Credits: 3 (RD)
Explores transitions and transformations in selected world religions as they respond to and influence forces of cultural change, social values, and the crises of history. Fresh or modified constructions of the sacred and their relationship to world and humans will be examined.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**RELI 636 - Religion and the Natural Environment**

Credits: 3 (NR)
Explores contemporary religious thought on the morality and ethics of environmental responsibility. Begins with an exploration of this issue in Western Christian thought and examines religious approaches to the environment in the traditional and contemporary thought of other major world religions, including Judaism, Islam, Hinduism, Buddhism, and the Chinese traditions.

*Hours of Lecture or Seminar per week: 3*
*Hours of Lab or Studio per week: 0*

**RELI 640 - Religion and Law**

Credits: 3 (NR)
Focuses on United States Supreme Court decisions on religion clauses over the last 50 years. Provides a close reading of court's opinions and considers material from religious legal traditions. Covers contemporary political debates on issues like prayer in public schools, displays of religious symbols, ceremonial references to God, and public aid to religious schools.

*Hours of Lecture or Seminar per week: 3*
*Hours of Lab or Studio per week: 0*

**RELI 642 - Sacred Language, Scripture, and Culture**

Credits: 3 (RD)
Explores how sacred languages and scriptures develop in major global religious traditions: study of grammar, syntax, and morphology of sacred languages; issues of inspiration, authority and canon. Also examines cultural dimensions of sacred language.

*Prerequisite(s):* Graduate standing, or permission of instructor.

*Notes:* May be repeated once when languages are different.

*Hours of Lecture or Seminar per week: 3*
*Hours of Lab or Studio per week: 0*

**Rehabilitation Science (RHBS)**

**RHBS 340 - Health, Disease and Dysfunction**

Credits: 3 (NR)
Focuses on basic epidemiology, health promotion and disease prevention, as well as impairments in normal function of the individual resulting in disease and dysfunction. Exploration of the individual and societal impact of health and disease. Introduces current rehabilitation and intervention strategies as well as classification of disease and disability.
RHBS 420 - Adult Health and Function

Credits: 3 (NR)
Approaches the study of function and normal development, how it is attained and how it is optimized with a multi-systems viewpoint. Focuses on the components of functional movement. Addresses strategies for assessing, promoting and maintaining functional independence. Highlights current treatment approaches of disease and dysfunction.

RHBS 490 - Clinical Research Internship

Credits: 3 (NR)
Practical experience in a clinical research setting under the direction of a mentor. Each student is required to work with an experienced clinical investigator who agrees to provide the trainee mentorship. Clinical research embraces a spectrum of scientific disciplines that use a variety of study methods. Therefore, the multidisciplinary approach to clinical research is emphasized during didactic interactions.

Equivalent to HHS 490 (2011-2012 Catalog)

Prerequisite(s): Course is open to honors college students only. In addition, an application must be submitted in the semester prior to enrollment in the course. During the semester prior to entry, students may be asked to acquire certain competencies/certifications in order to fully participate at their research site (for example, human subjects research protections training, lab safety certification, HIPAA training).

RHBS 506 - Clinical Exercise Physiology

Credits: 3 (NR)
Examines acute and chronic alterations, adaptations associated with exercise and training. Covers role of exercise therapy in preventing and rehabilitating from disease across lifespan. Particular emphasis on role of exercise therapy in cardiorespiratory, musculoskeletal, and metabolic diseases.

Equivalent to GCH 506 (2011-2012 Catalog).

Prerequisite(s): Bachelor’s degree with 8 credits in anatomy and physiology; or permission of instructor.
RHBS 510 - Scientific Basis for Pain and Fatigue

Credits: 3 (NR)
Reviews the scientific literature describing the theories of the initiation and perpetuation of pain, fatigue, and suffering. Describes the methodologies used to evaluate these symptoms. Students will apply the theories of pain, fatigue, and suffering and will further their understanding of specific clinical problems.

Equivalent to GCH 510 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

RHBS 550 - Foundations of Rehabilitation Science

Credits: 3 (NR)
Examines the field of rehabilitation science with emphasis on the core theories and models of this emerging discipline. Surveys various topics within rehabilitation science including the history and development of the field, assistive technologies, pathology and impairment research, functional limitations research, disability research, translational research, and ethical considerations in clinical and research settings.

Equivalent to GCH 550 (2010-2011 Catalog)

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

RHBS 570 - Movement Analysis of Function

Credits: 3 (NR)
Applies biomechanical principles of movement to analyze functional activities, including walking, sit-stand, lifting, reaching-carrying activities, and stairs negotiation. Focuses on joints and total body kinematics and kinetics, and the contribution of muscular activity to performance. Applies methods of analyzing human motion to estimate changes in forces and moments (torques) during functional performance. Addresses how age and injuries affect functional performance.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

RHBS 620 - Psychosocial Aspects of Rehabilitation
Credits: 3 (NR)
Explores social and psychological impacts of disability. Processes by which people with disabilities adapt to limitations will be examined, as will the influence society has in promoting independence/dependence among people with disabilities.

Equivalent to GCH 620 (2010-2011 Catalog)

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**RHBS 651 - Research Methods**

Credits: 3 (NR)
Explores quantitative and qualitative research methods, principles and techniques necessary for implementation of health science research.

Equivalent to GCH 651 (2011-2012 Catalog); GCH 551 (2010-2011 Catalog)

**Corequisite(s):** GCH 601 or graduate course in applied statistics.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

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**RHBS 702 - Biobehavioral Aspects of Health**

Credits: 3 (NR)
Examines the biological, psychological, and social factors that interact with and affect efforts people make in promoting good health and preventing illness and the recovery, rehabilitation, and psychosocial adjustment of patients with serious health problems.

Equivalent to GCH 702 (2010-2011 Catalog)

**Prerequisite(s):** GCH 601 or equivalent, or a graduate-level research methods course.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**RHBS 710 - Applied Physiology I**

Credits: 3 (NR)
Examines the primary bio-regulatory and communication systems. A detailed study of physiology for graduate students interested in health and human movement, chronic illness, and disability. Covers energy metabolism, endocrine, immune, neurological, and muscular systems.
Equivalent to GCH 710 (2010-2011 Catalog)

Prerequisite(s): One-year introductory biology sequence with labs or two-semester course sequence in anatomy and physiology.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

RHBS 711 - Applied Physiology II

Credits: 3 (NR)
Explores general systemic function. A detailed study of physiology for graduate students interested in health and human movement, chronic illness, and disability. Covers cardiovascular, pulmonary, gastrointestinal, renal, and reproductive systems.

Equivalent to GCH 711 (2010-2011 Catalog)

Prerequisite(s): RHBS 710

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

RHBS 720 - Principles of Clinical Trials

Credits: 3 (NR)
Provides a practical overview of the fundamental principles of clinical trial design and management, ethical and regulatory factors in the conduct of clinical trials, and their role in clinical practice, public health and decision making. Topics include clinical trial design, biostatistics, ethics and regulatory affairs, study management and oversight, and current concepts.

Prerequisite(s): Graduate level statistics and methods course(s) or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

RHBS 740 - Applied Physiology: Cardiorespiratory

Credits: 3 (NR)
Rigorous, evidence-based study of biological factors and medial conditions that limit oxidative metabolic function. Emphasis on examining current hypotheses of physical activity limitations in chronic illness and disability.

Equivalent to GCH 740 (2010-2011 Catalog)

Prerequisite(s): RHBS 506 or EFHP 610 or RHBS 710 or other graduate physiology course, plus one of the following: two-semester course sequence in anatomy and physiology (100 level or above) or one course in animal or comparative physiology (300 level or above) or one course in human physiology (300 level or above).
RHBS 745 - Metabolic Basis of Disability

Credits: 3 (NR)
Examines anatomy and physiology of organs and systems involved in regulating metabolism; assesses relationships among hormonal and central nervous system regulation in the production and regulation of energy.

Equivalent to GCH 745 (2010-2011 Catalog)

Prerequisite(s): RHBS 710

RHBS 746 - Neuromusculoskeletal Disability

Credits: 3 (NR)
Explores anatomy and physiology of musculoskeletal system, and its relationship to human motion; evaluates movement with respect to central and peripheral nervous systems; familiarizes students with human motion and differences in normal and disabled populations.

Equivalent to GCH 746 (2010-2011 Catalog)

Prerequisite(s): RHBS 710

RHBS 760 - Rehabilitation Science Colloquium

Credits: 1 (RD)
Public forum for the presentation and discussion of contemporary issues in the field of rehabilitation science.

Equivalent to GCH 760 (2010-2011 Catalog)

Prerequisite(s): Enrollment in PhD program in Rehabilitation Science or permission of the graduate director.

Notes: May be repeated for credit; however a maximum of three credits may be applied to the rehabilitation science Ph.D.
**RHBS 761 - Aging and Health Behavior**

Credits: 3 (NR)
Examines age-related changes in health and health behavior along with the impact of structural factors, societal, and personal attitudes toward aging. The successful aging paradigm will frame discussion of strategies for facilitating optimal health behaviors.

Equivalent to GCH 761 (2010-2011 Catalog)

Prerequisite(s): A graduate level course in psychology or research methods.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**RHBS 808 - Outcomes Measurement**

Credits: 3 (NR)
Examines the principles of measurement applied to both assessment and outcome measures commonly used in rehabilitation. The student will become familiar with the state of outcomes research in the field of rehabilitation science.

Equivalent to GCH 808 (2010-2011 Catalog)

Prerequisite(s): RHBS 550 and RHBS 551.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

**RHBS 816 - Comparative Effectiveness Research**

Credits: 3 (NR)
Examines the theory and methods of comparative effectiveness studies and their relationship to developing Rehabilitation Science and other disciplines to effect better clinical practice by identifying benefits/harms of prevention and treatment and explores the implications of evidence for comparative effectiveness in developing health care policy.

Prerequisite(s): Graduate level statistics and methods course(s) or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring.
RHBS 940 - Independent Study

Credits: 1-6 (RD)
In-depth study of selected area of rehabilitation science under the direction of faculty.

Equivalent to GCH 940 (2010-2011 Catalog)

Prerequisite(s): Enrollment in PhD program and permission of instructor.

Notes: May be repeated as needed, up to a maximum of 24 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12
Grading: Satisfactory/No Credit
When Offered: Fall, Spring, Summer

RHBS 960 - Directed Research

Credits: 1-6 (RD)
Research on a pertinent topic in rehabilitation science. Must be arranged with instructor before registering.

Prerequisite(s): Permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Summer, Spring.

RHBS 999 - Dissertation Research

Credits: 1-9 (RD)
Dissertation research on a specific topic under the direction of a faculty member.

Equivalent to GCH 999 (2010-2011 Catalog)

Prerequisite(s): Enrollment in PhD program in rehabilitation science and permission of graduate director.

Notes: May be repeated, up to a maximum of 24 credits.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-9
Grading: Satisfactory/No Credit
When Offered: Fall, Spring, Summer

Russian (RUSS)

Offered by the College of Humanities and Social Sciences
Placement: See Academic Testing section of Admission chapter.

RUSS 101 - Elementary Russian I

Credits: 3 (NR)
For students with no knowledge of Russian. Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Students may not receive credit for RUSS 101 and RUSS 109 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 102 - Elementary Russian II

Credits: 3 (NR)
Continuation of RUSS 101.

Prerequisite(s): RUSS 101 or permission of department.

Notes: Students may not receive credit for RUSS 102 and RUSS 109 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 109 - Intensive Elementary Russian

Credits: 6 (NR)
Recommended for students who desire intensive introduction.

Notes: Students may not receive credit for RUSS 109 and RUSS 101, 102, or 110.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 2

RUSS 110 - Elementary Russian

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Students may not receive credit for RUSS 110 and RUSS 101, 102, or 109.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0
RUSS 199 - Russian Language and Culture for Students and Professionals

Credits: 3 (NR)
Designed for English-speaking specialists in humanities, sciences, and business studies in Russia. Covers range of topics, including elementary Russian phonetics and grammar, basic conversation, and Russian etiquette. Course theme is language needs of foreigners who happen to be traveling and conducting business activities in Russia. Acquaints students and professionals with cultural framework that forms indispensable backdrop to daily activities in Russia. Students become increasingly confident and effective in their ability to engage Russians from all walks of life in daily informal and professional conversation in the Russian language.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 201 - Intermediate Russian I

Credits: 3 (NR)
Further development of skills in listening, speaking, reading, and writing.

Prerequisite(s): RUSS 102, 109, appropriate placement score, or permission of department.

Notes: RUSS 201 and 202 must be taken in sequence. Students may not receive credit for RUSS 201 and RUSS 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 202 - Intermediate Russian II

Credits: 3 (NR)
Application of language skills to reading, composition, and discussion.

Prerequisite(s): RUSS 201, appropriate placement score, or permission of department.

Notes: Students may not receive credit for RUSS 202 and RUSS 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 209 - Intensive Intermediate Russian

Credits: 6 (NR)
Equivalent to RUSS 201 and 202 taught in a single semester.

Prerequisite(s): RUSS 102, 109, appropriate placement score, or permission of department.
Notes: Students may not receive credit for RUSS 209 and RUSS 201, 202, or 210.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

RUSS 210 - Intermediate Russian

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Russian-speaking regions. Lab work required.

Prerequisite(s): RUSS 110 or appropriate placement score.

Notes: Students may not receive credit for RUSS 210 and RUSS 201, 202, or 209.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

RUSS 250 - Gateway to Advanced Russian

Credits: 3 (NR)
Integration of advanced intermediate-level Russian grammar, reading, writing, listening and speaking skills with the development of research skills and critical thinking about authentic texts from contemporary media.

Prerequisite(s): RUSS 210, appropriate placement score, or permission of department.

Notes: Taught in Russian.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 302 - Russian Conversation and Composition

Credits: 3 (NR)
Develops in students ability to express themselves orally on topics of current interest and everyday situations. Provides practice in more difficult forms of written expression.

Fulfills writing intensive requirement in the major.

Prerequisite(s): RUSS 250, appropriate placement score, or permission of instructor

Notes: Taught in Russian.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
RUSS 303 - Russian Advanced Conversation  
Credits: 3 (NR)  
Development of oral proficiency. Includes current colloquial expressions.  
Prerequisite(s): RUSS 250, appropriate placement score, or permission of instructor.  
Notes: Taught in Russian.  
Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  

RUSS 310 - Readings in Russian Literature  
Credits: 3 (NR)  
Readings of Russian literary works in original language with lectures, discussions, and exam in Russian.  
Prerequisite(s): RUSS 250, appropriate placement score or permission of instructor.  
Notes: Taught in Russian.  
Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  

RUSS 311 - Contemporary Russian Short Fiction  
Credits: 3 (NR)  
Reading and discussion of recent short stories by best-known Russian writers of today.  
Prerequisite(s): RUSS 250, appropriate placement score or permission of instructor.  
Notes: Taught in Russian. Readings in original language.  
Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  

RUSS 325 - Major Russian Writers  
Credits: 3 (RT)  
Study of works of major Russian writers in translation. Writers to be studied vary.  
Fulfills general education requirement in literature.  
Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.  
Notes: Taught in English. May be repeated once for credit when course content is different.
RUSS 326 - A Survey of Russian Literature

Credits: 3 (NR)
Surveys Russian literature from its beginning to 1880.

Fulfills general education requirement in literature.

Prerequisite(s): 60 credits, or permission of instructor.

Notes: Taught in English.

RUSS 327 - A Survey of Russian Literature

Credits: 3 (NR)
Surveys Russian literature of late 19th and 20th centuries.

Fulfills general education requirement in literature.

Prerequisite(s): 60 credits, or permission of instructor.

Notes: Taught in English.

RUSS 353 - Russian Civilization

Credits: 3 (NR)
Civilization and culture of Russia and former Soviet Union. Includes films, slides, and music in addition to readings and lectures.

Fulfills general education requirement in synthesis.

Prerequisite(s): 60 credits, and completion or concurrent enrollment in all other required general education courses

Notes: Taught in English. Fulfills the college requirement in non-Western culture.
RUSS 354 - Contemporary Post-Soviet Life

Credits: 3 (NR)
Social life, art, economics, education, view of life, and personal aspirations of Russian citizen today.

Fulfills general education requirement in global understanding.

Prerequisite(s): 60 credits, or permission of instructor.

Notes: Taught in English. Fulfills the college requirement in non-Western culture.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 380 - Advanced Russian I

Credits: 3 (NR)
Comprehensive study of the more difficult characteristics of contemporary standard Russian in areas of grammar, style, and vocabulary usage. Emphasizes developing fluency in oral and written expression.

Prerequisite(s): RUSS 202, 209, or equivalent; appropriate placement score; or permission of instructor

Notes: Taught in Russian.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 381 - Advanced Russian II

Credits: 3 (NR)
Comprehensive study of the more difficult characteristics of contemporary standard Russian in areas of grammar, style, and vocabulary usage. Emphasizes developing fluency in oral and written expression.

Prerequisite(s): RUSS 202, 250, or equivalent; appropriate placement score; or permission of instructor.

Notes: Taught in Russian.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 401 - Readings in the Social Sciences

Credits: 3 (NR)
Reading, translation, and discussion of Russian materials in fields of history, politics, geography, and sociology.

Prerequisite(s): 15 credits of Russian or equivalent.
Notes: Taught in Russian.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 407 - Russian Drama and Theater

Credits: 3 (NR)
Development of Russian theater including directing techniques in Moscow Art Theater. Reading and discussion of major Russian plays of 19th and 20th centuries.

Prerequisite(s): 60 credits, or permission of instructor.

Notes: Course work in English; knowledge of Russian not required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 410 - Russian Poetry

Credits: 3 (NR)
Historical development of Russian poetry and representative works of major poets.

Prerequisite(s): 15 credits of Russian or equivalent.

Notes: Reading in Russian; course work in English and Russian.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 470 - Topics in (Post) Soviet Film

Credits: 3 (RD)
Russian, Soviet, and post-Soviet films selected by type, period, or director with emphasis varying from year to year. Required viewings, student discussion, and written critiques.

Prerequisite(s): 60 credits, or permission of instructor.

Notes: Taught in English. May be repeated once with permission of department or film studies adviser.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 480 - Fourth-Year Russian
Credits: 3 (NR)
Advanced work in major grammatical and lexical topics of Russian. Application of theoretical principles in guided written and oral exercises.

Prerequisite(s): RUSS 380, 381, or equivalent; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 481 - Fourth-Year Russian

Credits: 3 (NR)
Advanced work in major grammatical and lexical topics of Russian. Application of theoretical principles in guided written and oral exercises.

Prerequisite(s): RUSS 380, 381, or equivalent; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 490 - Independent Study

Credits: 1-3 (NR)
Research and analysis of selected problem in language, literature, or culture in consultation with member of Russian studies faculty.

Prerequisite(s): Russian studies major with 90 credits and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

RUSS 491 - Independent Study

Credits: 1-3 (NR)
Research and analysis of selected problem in language, literature, or culture in consultation with member of Russian studies faculty.

Prerequisite(s): Russian studies major with 90 credits and permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

RUSS 499 - Seminar on Russian Literary and Critical Bibliography
Credits: 3 (NR)
Comprehensive bibliographic survey of major primary and secondary works of Russian literature and criticism.

Prerequisite(s): Russian studies major with 90 credits and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

School of Management (SOM)

Offered by the School of Management

SOM 100 - Business in American Society

Credits: 3 (NR)
Provides students with a foundation for understanding the role of business in society by exploring the nature and history of business enterprise, the social context of business, and the interaction of individuals with business by selecting current events in business and analyzing the content as well as the impact of the reported activities.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SOM 301 - Business Models: A Communication Approach

Credits: 3 (NR)
Introduces fundamentals of business models, and writing as learning tool. Interrelationships among accounting, finance, information systems, marketing, and operations are subject of several "learning by writing" deliverables.

School of Management students will not be permitted to make more than three attempts to achieve a C or higher in SOM 301. Those who do not successfully complete this course within three attempts will be terminated from their major and will not be eligible to receive a degree from the School of Management. For more information about this, see the “Termination from the Major” section under Academic Policies.

Fulfills writing intensive requirement in the major.

Corequisite(s): OM 210 and ACCT 203

Notes: Fulfills writing intensive requirement for SOM majors. Taught in lecture/recitation format; requires attendance at weekly lecture and weekly recitation.

Hours of Lecture or Seminar per week: 3
SOM 492 - Undergraduate Internship

Credits: 3 (NR)
Opportunity to gain practical, professional experience in conjunction with academic development. Internship is an important part of academic and career preparation. May be used as elective credit, but may not be repeated.

Prerequisite(s): Degree status.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOM 498 - Capstone Course: Advanced Business Models

Credits: 3 (NR)
Advanced integrated exploration of business models and industry dynamics that uses case analyses to assess competition, organizational strategy, and firm performance. Students examine strategic change in organizations from multiple perspectives, integrating knowledge from core course work into several papers and major presentation. Students receive coaching from area business leaders as they complete their presentations.

Fulfills general education requirement in synthesis.

Prerequisite(s): ACCT 301, BULE 302, OM 301, FNAN 301, MGMT 301, MIS 301, and MKTG 301; senior standing; degree status. Prerequisite enforced by registration system.

Notes: Fulfills synthesis requirement for SOM majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

Social Work (SOCW)

Offered by the Health and Human Services

SOCW 110 - Global Perspectives on Human Rights

Credits: 3 (NR)
Explores awareness about human rights issues around the world. Students will become familiar with current debates about human rights, especially whether rights should be culturally determined. The role of the United Nations, governmental and nongovernmental organizations, including social service organizations will be presented. Emerging issues including the rights of children; the rights to food, shelter, and health care; and racial and economic equality will be emphasized.
Notes: Open to social work and nonsocial work majors; does not count toward the social work degree requirements.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 200 - Introduction to Social Work**

Credits: 3 (NR)
Introduces historical roots of social work profession and social welfare. Person-in-environment perspective discussed as framework for social work knowledge, values, and skills. Initial course in social work curriculum introduces social work profession, professional values, ethics, fields of practice, and settings in which social workers are employed. Highlights profession's commitment to diverse and at-risk populations and social and economic justice. Presentations by social work professionals in different fields of practice supplement classroom lecture, discussion, and small-group exercises.

Notes: Open to all majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 301 - Laboratory in Interpersonal Communication**

Credits: 4 (NR)
Emphasizes experiential learning of biological, psychological, social, and cultural influences on behavior of those who need and those who give help. Students examine their own behavioral and learning patterns, values, ethics, and attitudes to increase ability to understand and help clients.

Prerequisite(s): SOCI 101, PSYC 100, and at least sophomore standing.

Notes: Service learning of at least 60 hours required.
Open to majors only.

Hours of Lecture or Seminar per week: 4
Hours of Lab or Studio per week: 0

**SOCW 323 - Human Behavior and the Life Course**

Credits: 3 (NR)
Social systems approach unifying and integrating concepts and knowledge from biology, anthropology, sociology, and psychology about human behavior. Applications to professional practice, from social work literature to field experience.

Fulfills general education requirement in synthesis.

Prerequisite(s): SOCI 101, BIOL 103, and PSYC 100 or permission of the instructor.

Notes: Open to all majors.

Hours of Lecture or Seminar per week: 3
SOCW 340 - Human Behavior within Macro Systems

Credits: 3 (NR)
Examines social systems theories as they pertain to study of macro systems. Focus of study involves families, social group, formal organization, and community. Students apply theoretical concepts to contemporary social problems.

Equivalent to SOCW 324 (2010-2011 Catalog)

Prerequisite(s): SOC 101, BIOL 103 and PSYC 100 or permission of the instructor

Notes: Students may not take SOCW 340 if they have already received credit for SOCW 324.

SOCW 351 - Social Policy and Social Justice

Credits: 3 (NR)
Introduces students to the knowledge and skills needed to frame and analyze social problems and social policies in the context of social justice. Examines the historical development, central concepts, and institutional nature of the contemporary welfare state and major social policies that have emerged in response to changing social, political, economic, and cultural influences.

Prerequisite(s): SOCW 200 and SOCI 101; or permission of the instructor.

Notes: Open to all majors.

SOCW 357 - Methods of Social Work Intervention I

Credits: 3 (NR)
Social work practice from systems perspective. Particular emphasis on problem-solving activities with microsystems. Analyzes common core of knowledge, values, and skills essential to social work practice to gain insight into social work functions and role of social worker as change agent.

Prerequisite(s): SOCI 101, PSYC 100, or permission of instructor. SOCW 200 (Majors only)

Corequisite(s): SOCW 200 (Majors only)

Notes: Open to all majors.
SOCW 358 - Methods of Social Work Intervention II

Credits: 3 (NR)
Continues generic problem-solving model, focusing on group and macro intervention systems, settings, and skills. Emphasizes working with both treatment and task groups. Group processes, such as goal formulation, contract setting, composition, and termination necessary for effective worker intervention, are part of knowledge base.

Prerequisite(s): SOCW 301 and 357 (C or better). Majors only.

Notes: Open to majors only. Field service of 40 hours required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 359 - Junior Seminar

Credits: 1 (NR)
Provides opportunity to integrate theory, research, and practice in area of group work. Time is allotted to process successes and obstacles, and to share issues, knowledge, and skills learned in service-learning site.

Prerequisite(s): SOCW 301

Corequisite(s): Must be taken simultaneously with SOCW 358.

Notes: Forty hours of service learning are required. Open to SOCW majors only.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

SOCW 362 - Group and Family Interventions

Credits: 3 (NR)
Provides students the opportunity to integrate theory, research, and practice in the area of group work and family interventions. Classroom simulation of group skills and how to work with families will occur. Collaboration with community agencies working with groups and families is required.

Equivalent to SOCW 359 (2010-2011 Catalog)

Prerequisite(s): SOCW 301 with a minimum grade of C.

Corequisite(s): SOCW 358

Notes: Open to SOCW majors only. Students may not take SOCW 362 if they have already received credit for SOCW 359.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring
SOCW 370 - Social Policy Analysis and Advocacy

Credits: 3 (NR)
Introduces students to the knowledge and skills needed to influence social policy outcomes and advocate for social change. Explores the role of social workers in legislative policy analysis and advocacy. Students gain skills in policy practice, legislative research, developing and presenting recommendations, and testifying.

Equivalent to SOCW 352 (2010-2011 Catalog)

Prerequisite(s): SOCW 200 and GOVT 103 or 132, or permission of instructor.

Notes: Students may not take SOCW 370 if they have already received credit for SOCW 352.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SOCW 400 - Legal and Ethical Issues in Human Services

Credits: 3 (NR)
Overview of ethical and legal issues related to human services professions. Topics include responsibility, competence, duty to warn, confidentiality, professional relationships, and research. Emphasizes models of ethical decision making and critical thinking.

Prerequisite(s): 45 credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 410 - Alcohol and Substance Abuse: Policies and Programs

Credits: 3 (NR)
Primary issues related to alcoholism and drug abuse including key concepts, theories, policies, and research regarding use and abuse of alcohol and other drugs. Emphasizes impact of policies and programs on well-being of ethnic minority and disadvantaged service populations.

Prerequisite(s): 45 credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 415 - Child and Family Welfare
Credits: 3 (NR)
Emphasizes viewing human development and child and family welfare services critically, holistically, and contextually. Integrates ecological systems, human rights, and empowerment perspectives for understanding delivery systems and persons in relation to their environment across levels from individual to global. Provides overview of existing child welfare system with focus on current issues, challenges, and at-risk populations.

Prerequisite(s): 45 credits or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 417 - Integrative Methods in Social Action and Social Change**

Credits: 3 (NR)
Uses generalist social work practice concepts with large systems and provides students with a hands-on opportunity to apply concepts and principles of intervention with large systems. Students will work with organizations and communities on a local, national, or global level to promote social action and social change. The course will also focus on evaluating interventions addressing the social justice needs of diverse, at-risk, and oppressed populations.

Prerequisite(s): SOCW 301, 357, 358, 359, 452, 453. Open only to Social Work majors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 423 - Social Work with Children and Adolescents**

Credits: 3 (NR)
Major needs of children and adolescents, and implications for social work practice. Problems of family and peer group relationships, occupational choice, sexual and scholastic adjustment, and special problems of racial and cultural alienation, alcohol and drug abuse, and delinquency. Reviews various theoretical orientations and evidence from research. Analyzes both individual and group approaches to counseling and treatment.

Prerequisite(s): 45 credits or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 425 - Planning and Organizing for Community Change**

Credits: 3 (NR)
Designed for senior social work students with interest in pursuing community organization as professional career specialty. Provides basic understanding of community organization and planning, with special emphasis on conducting needs assessment in community. Students examine environmental context in which administrative and community practice occurs. Explores role of social workers as planners and agents of social change.

Prerequisite(s): 45 credits or permission of the instructor.
SOCW 435 - Introduction to Gerontology

Credits: 3 (NR)
Surveys issues related to working with older adults, their families, and care providers. Studies biological, psychological, and sociocultural aspects of aging, and unique problems with service delivery to older persons. Examines forces that impinge on an older person, and explores critical issues related to extended life span, family changes, institutionalization, and role of older persons in society.

Prerequisite(s): 45 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

SOCW 445 - Social Determinants of Health

Credits: 3 (NR)
Examine the social determinants of health and the application of this framework to social work and public health policy and practice interventions. Explore the many social justice factors that affect health and consider which community systems and social change approaches may decrease or eliminate health inequities.

Equivalent to GCH 445

Prerequisite(s): 45 credits or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

SOCW 452 - Senior Seminar I

Credits: 2 (NR)
Provides integrative team experience to support field experience and provide opportunities to demonstrate required competencies through special assignments.

Prerequisite(s): SOCW 200, 301, 323, 324, 351, 352, 357, 358, and 359, with a C or better and recommendation of faculty. Open only to SOCW majors. All sections are controlled. Contact department for registration.

Corequisite(s): Concurrent with Senior Practicum I (SOCW 453).

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
SOCW 453 - Senior Practicum I

Credits: 3 (NR)
Supervised learning experience (practicum) under guidance of qualified faculty liaisons and professional staff designated and approved by director of field education. Designed to facilitate practice with individuals, families, groups, and communities. Students spend two full days weekly in practicum sites.

Prerequisite(s): SOCW 200, 301, 323, 324, 351, 352, 357, 358, and 359, with a C or better and recommendation of faculty. Open only to SOCW majors. All sections are controlled. Contact department for registration.

Notes: Requires concurrent seminar (SOCW 452) participation and faculty-agency visits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

SOCW 454 - Senior Seminar II

Credits: 2 (NR)
Continuation of integrative team experience designed to support practicum experience and provide opportunities to demonstrate required competencies through special assignments.

Prerequisite(s): SOCW 452, 453, 471 with a grade of C or better.

Corequisite(s): SOCW 456

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

SOCW 456 - Senior Practicum II

Credits: 3 (NR)
Continuation of supervised learning experience (practicum) begun in SOCW 453. Students spend two full days weekly in practicum sites supervised by faculty liaisons and qualified professional staff designated and approved by director of field education.

Corequisite(s): SOCW 454

Notes: Requires concurrent seminar participation (SOCW 454) and faculty-agency visits. Open to SOCW majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

SOCW 471 - Research in Social Work
Principles and theory underlying scientific inquiry. Emphasizes use of research in social work practice, steps in conducting research, and research efforts in developing and evaluating social work knowledge and skills.

Fulfills writing intensive requirement in the major.

Prerequisite(s): SOCI 313 or PSYC 300; SOCW 200, 301, 323, 351, 357; senior standing or permission of the instructor

Notes: Must be completed with minimum grade of C.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 475 - Selected Topics in Social Work Policy

Credits: 3 (RT)
In-depth study of special areas of social work of interest to students, faculty, and social work community.

Prerequisite(s): 45 credits, or permission of instructor.

Notes: May be repeated for maximum 9 credits if topics vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 480 - Research Internship in Health and Human Services

Credits: 3 (NR)
The student works as a member of a team engaged in health and human services research and attends a bi-weekly research seminar. Under direction of the course seminar leader and the faculty research mentor, the student will acquire selected research skills and develop introductory research writing and presentation skills.

Equivalent to HHS 480, HAP 480

Prerequisite(s): Open only to CHHS majors or students who have completed CHHS minor or certificate courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SOCW 483 - Selected Approaches to Social Work Intervention

Credits: 3 (RT)
Opportunity to examine personal use of different approaches to social work intervention currently employed in practice settings. Students use technical skills with clients that these approaches require.

Prerequisite(s): 45 credits, or permission of instructor.
Notes: May be repeated for maximum 9 credits if topics vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 499 - Independent Study in Social Work**

Credits: 1-3 (RD)
Investigates research problem in field of social work.

Prerequisite(s): 60 credits and research proposal approved by instructor before enrollment.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 598 - Special Topics in Social Work**

Credits: 1-6 (RD)
Critical examination of special topics related to social work, social justice, and human rights.

Prerequisite(s): Upper-level undergraduate or graduate standing.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**SOCW 623 - Human Behavior and Social Systems I**

Credits: 3 (NR)
Ecological approach to behavior of individuals, families, groups, organizations, and communities. Integrates and applies theories from psychology, sociology, biology, and anthropology to study of infants, children, and adolescents. Emphasizes human diversity.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 624 - Human Behavior and Social Systems II**

Credits: 3 (NR)
Continues study of human behavior and diversity by exploring application of development theory and ecological principles to those in young adulthood, middle adulthood, and older adulthood.
**Prerequisite(s):** SOCW 623.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**SOCW 630 - Forensic Social Work Practice**

Credits: 3 (NR)
Explores the social work role in legal processes relating to such issues as family violence, child custody, behavioral health, disabilities, aging, and juvenile/criminal justice. Apply skills in forensic interviewing, risk assessment, expert testimony, mitigation, mediation, treatment, victim advocacy, and multidisciplinary collaboration.

**Prerequisite(s):** SOCW 624, 652, 658, and 673.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**SOCW 640 - Advanced Clinical Practice**

Credits: 3 (NR)
Prepares students at the advanced level to apply diagnostic, assessment, prevention, treatment, and intervention skills with individuals, families, and groups in clinical mental health and health settings. Trains students in differential diagnosis and assessment using the Revised Diagnostic and Statistical Manual (DSM IV-TR). Currently accepted treatment interventions within the context of contemporary social work theory are also presented.

**Prerequisite(s):** SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, 673 and 680

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**SOCW 645 - Community-Centered Clinical Practice**

Credits: 3 (NR)
Students use an ecosystems framework for assessment, risk-reduction, prevention, and intervention with communities in a local, national, or international context. Possible areas of exploration include violence prevention and intervention, suicide prevention and intervention, emergency response efforts, and behavioral health or wellness interventions at the community level.

**Prerequisite(s):** SOCW 624, 652, 658, and 673.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**SOCW 651 - Social Policies, Programs, and Services**
History of American social welfare policy and social work profession. Explores political, economic, social, cultural, and ideological influences on policy making with emphasis on consequences for populations at risk. Introduces historical policy analysis.

**Prerequisite(s):** Graduate standing

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### SOCW 652 - Influencing Social Policy

Credits: 3 (NR)  
Introduces students to the knowledge, skills, and values needed to influence policy outcomes. Explores the role of social workers in electoral politics and policy advocacy. Students gain skills in legislative research, coalition building, testifying, constituent organizing, and lobbying, while developing strategies for promoting social justice through policy change.

**Prerequisite(s):** SOCW 651.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### SOCW 653 - Immigration Policy

Credits: 3 (NR)  
Prepares students for advocacy on behalf of immigrants from a human rights and social justice perspective. Explores policies, economic forces and historical precedence abetting global migration. Abets development of an in-depth knowledge of national and local policies as they pertain to immigrants, and how issues relate to social work advocacy.

**Prerequisite(s):** Completion of all first-year graduate coursework or advanced standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

### SOCW 654 - Social Policy for Children and Youth

Credits: 3 (NR)  
Examines social policies, programs, and services on behalf of children and youth with implications for social work; including child welfare, child and adolescent health and mental health, juvenile justice, and school social work. Explores how societal norms regarding family and definitions of children's well-being influenced these policies over time.

**Prerequisite(s):** Completion of MSW foundation coursework.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer
**SOCW 655 - Aging Programs and Policies**

Credits: 3 (NR)
Analyzes the evidence-based benefits and challenges of social welfare and health care policy at the local, state, and federal levels on programs and services for older persons and their families. Fosters an understanding of the context of administrative structures, and legislative context of social policy and aging with attention to diversity and ethics.

Prerequisite(s): SOCW 652 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

**SOCW 657 - Direct Social Work Practice I**

Credits: 3 (NR)
Introduces role of social workers as change agents and the core knowledge, values, and skills that guide social work practice with individuals, families, small groups, organizations, and communities.

Prerequisite(s): Graduate standing and open only to students enrolled in MSW degree program.

Corequisite(s): SOCW 672.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 658 - Direct Social Work Practice II**

Credits: 3 (NR)
Continuation of social work theory and practice with individuals, families, groups, organizations, and communities. Emphasizes intervention, evaluation, follow-up, and termination, with attention to incorporating social work knowledge, values, and skills.

Prerequisite(s): SOCW 657; Open to students enrolled in MSW degree program

Corequisite(s): SOCW 673

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCW 670 - Communication and Technology for Social Work Practice**

Credits: 3 (NR)
Studies various forms of written communication pertinent to social work practice. Examines impact of audience, status, culture, and purpose on effective professional writing.
Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 671 - Research Methods for Social Workers

Credits: 3 (NR)
Examines role of scientific inquiry in social work. Emphasizes construction and use of measurement instruments, data collection, analysis, and interpretation, and application of computer technologies relevant to social work practice.

Prerequisite(s): SOCW 624 and 652.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 672 - Foundation Field Practicum and Seminar I

Credits: 3 (NR)
Supervised social work learning experience in human service agencies. Students complete 20 hours per week in field practicum, and attend monthly seminar in which they share learning and integrate theory with practice.

Corequisite(s): SOCW 657.

Notes: Open only to MSW degree students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

SOCW 673 - Foundation Field Practicum and Seminar II

Credits: 3 (NR)
Continuation of supervised social work learning experience begun in SOCW 672. Students spend 20 hours per week in field practicum, and attend monthly seminar in which they share learning, process experiences, and integrate theory with practice.

Prerequisite(s): SOCW 672.

Corequisite(s): SOCW 658.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special
**SOCW 674 - Psychopathology**

Credits: 3 (NR)
Overview of adult and child psychopathology presented within the contexts of the lives of people experiencing mental disorders and the social contexts that can have a bearing on symptom maintenance. Learn to formulate competency-based assessments and DSM IV-TR-based differential diagnoses.

**Prerequisite(s):** All foundation year coursework (SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, and 673).

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCW 675 - Selected Topics in Clinical Practice**

Credits: 3 (NR)
In-depth study of special topics related to clinical social work practice at the individual, family, small group, or community level.

**Prerequisite(s):** 30 credits or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCW 676 - Selected Topics in Social Work and Social Change**

Credits: 3 (NR)
Critical examination of special topics related to understanding and improving community and societal conditions through policy practice, program development, and social action.

**Prerequisite(s):** 30 graduate credits or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCW 677 - Family Therapy**

Credits: 3 (NR)
Examines research and theory relevant for assessment and intervention with families. Students will learn to conduct a family assessment, taking cultural diversity, non-traditional family structures including single-parent and GLBTQ families, and socioeconomic factors into account. Students will develop skills in implementing an intervention based on the family’s strengths and challenges.

**Prerequisite(s):** Completion of MSW foundation coursework.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer
SOCW 678 - Trauma and Recovery

Credits: 3 (NR)
Explores complex traumatic stress disorders, the process of recovery, and the etiology of healing in contemporary North American Culture. Diagnostic criteria, assessment strategies and evidence-based treatment options for complex traumatic stress disorders across diverse populations including sexual trauma, war, early childhood trauma and natural disasters will be addressed.

Prerequisite(s): Completion of MSW foundation coursework.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

SOCW 679 - Military Social Work

Credits: 3 (NR)
Examines research and theory relevant for social work practice with service members, veterans, and their families. The course addresses the military as a workplace culture, evidence-based approaches for post-traumatic stress and co-morbid conditions, clinical practice with military families, preventive care and the service delivery system in military and civilian settings.

Prerequisite(s): Completion of MSW foundation coursework.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

SOCW 680 - Clinical Field Practicum

Credits: 6 (NR)
Supervised social work learning experience four days per week. Students placed in public, nonprofit or for-profit mental health and health venues reflecting specific interests in advanced clinical practice with individuals, families and groups, community-centered clinical practice, or forensic social work.

Prerequisite(s): SOCW 673, 630, 640, 645, and 688

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

SOCW 681 - Clinical Field Seminar

Credits: 3 (NR)
Assists students in critically analyzing their field experiences in the application of mental health assessment and interventions, working with individuals, families, groups, and communities. Students are expected to apply social work knowledge, values, and skills from their advanced clinical course work.
Corequisite(s): SOCW 680.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 682 - Substance Abuse Interventions

Credits: 3 (NR)
Develops knowledge and skills for direct practice in the field of addictions. The course covers the knowledge base regarding evidence-based interventions at all stages in the process of intervention with individuals, families, and groups that promote recovery from addiction to drug and alcohol abuse.

Prerequisite(s): Completion of MSW foundation coursework.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

SOCW 684 - Social Work and the Law

Credits: 3 (NR)
Students engage in close analysis of judicial opinions to explore the role of the courts in creating public policy. Areas of inquiry include the role of social workers in the legal system, the nature of legal proceedings, and how the law shapes policy in relation to issues affecting children, youth, families, older adults, women, minorities, people in poverty, and other vulnerable populations.

Prerequisite(s): SOCW 624, 652, 658, and 673.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 685 - Organizational Leadership for Social Workers

Credits: 3 (NR)
Examines functions and structure of human service organizations in context of service delivery. Development of theoretical knowledge, professional ethics, and skills in administration, leadership, management, organization, and supervision.

Prerequisite(s): SOCW 624, 652, 658, and 673.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 687 - Empowering Communities for Change
SOCW 688 - Advanced Research in Social Work

Credits: 3 (NR)
Explores social work intervention research, needs assessment, formative and summative program evaluation, and cost analyses. Discusses applications of systematic inquiry at the practice, organizational, and policy levels. Addresses ethical, pragmatic, and political considerations; qualitative approaches; quality performance; evidence from empirical research; and evaluation design.

Prerequisite(s): SOCW 624, 652, 658, 671, and 673.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

SOCW 689 - Clinical Practice with Older Adults

Credits: 3 (NR)
Examines age-associated changes and challenges faced by older adults. Focus is strengthening assessment and intervention skills with older adults, their family members and caregivers within the community and long-term care facilities, determining the best standardized instruments to use, and developing effective questions for assessment. Attention is given to the resilience of elders, ethical issues and diversity.

Prerequisite(s): SOCW 674 or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

SOCW 690 - Social Change Field Practicum

Credits: 6 (NR)
Supervised social work learning experience four days per week. Students placed in public, nonprofit, or for-profit venues reflecting specific interests in agency supervision, organizational management, community change, electoral policies, or social policy.

Prerequisite(s): SOCW 673, 684, 685, 687, and 688.

Hours of Lecture or Seminar per week: 1-3
SOCW 691 - Social Change Field Seminar

Credits: 3 (NR)
Processing of field practicum experiences; analysis of successes and challenges; application of social work knowledge, values, and skills from across the curriculum. Culminates in professional presentations by students.

Corequisite(s): SOCW 690.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 692 - Clinical Practicum I

Credits: 3 (NR)
Students participate in a supervised clinical social work field practicum for 20 hours per week. The clinical field seminar accompanies the clinical concentration year practicum. The seminar is designed to assist the student in critically analyzing their field experiences in the application of mental health assessment, risk reduction and interventions working with individuals, families, groups, and communities.

Prerequisite(s): SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, 673

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

SOCW 693 - Clinical Practicum II

Credits: 3 (NR)
Students participate in a supervised clinical social work field practicum for 20 hours per week. The clinical field seminar accompanies the clinical concentration year practicum. The seminar is designed to assist the student in critically analyzing their field experiences in the application of mental health assessment, risk reduction and interventions working with individuals, families, groups, and communities.

Prerequisite(s): SOCW 623, 624, 630, 651, 652, 657, 658, 670, 671, 672, 673, 674, 688, and 692

Notes: This is a continuation of SOCW 692 taken in the Fall semester.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

SOCW 694 - Social Change Practicum I
Credits: 3 (NR)
Students participate in a supervised clinical social work field practicum for 20 hours per week. The clinical field seminar accompanies the concentration year practicum. The seminar is designed to assist students in processing their field experiences and analyzing their successes and challenges. Students are expected to apply social work knowledge, values, and skills from across the curriculum.

Prerequisite(s): SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, 673

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

SOCW 695 - Social Change Practicum II

Credits: 3 (NR)
Students continue to work in a supervised social work field practicum for 20 hours per week. At the end of this semester students will have completed 300 hours of field work to meet the total number of 600 hours required for the concentration year practicum. The field seminar accompanies the concentration year practicum. The seminar is designed to assist students in processing their field experiences and analyzing their successes and challenges. Students are expected to apply social work knowledge, values, and skills from across the curriculum.

Prerequisite(s): SOCW 623, 624, 651, 652, 657, 658, 670, 671, 672, 673, 684, 685, 688, and 694

Notes: Continuation of SOCW 693 from the Fall semester.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

SOCW 697 - Thesis Project Seminar

Credits: 3 (NR)
Provides structured opportunity for students to work with each other and faculty in developing their final MSW thesis projects. Integrates and applies learning from all previous course work, emphasizing knowledge, skills, and values related to research, clinical practice, policy, community practice, and organizational leadership. Social work ethics, empowerment of populations at risk, and systems transformation will be explored. In addition to group meetings, students will meet individually with their faculty mentors.

Prerequisite(s): Social Change: SOCW 684, 685 and 688.
Clinical Practice: SOCW 630 and 688.


Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCW 699 - Independent Study in Social Work
Credits: 1-3 (RT)
Investigates research problem in field of social work.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

Sociology (SOCI)

Offered by the College of Humanities and Social Sciences

SOCI 101 - Introductory Sociology

Credits: 3 (NR)
Introduction to basic sociological concepts. Examines aspects of human behavior in cultural framework, including individual and group interaction, social mobility and stratification, status and class, race and gender relations, urbanism, crime and criminology, and social change and reform.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 120 - Globalization and Society

Credits: 3 (NR)
Examines and analyzes important global issues and processes. Considers historical development of globalization and implications for different societies and cultures. Investigates perceptions of global processes by different cultures and nations, and efforts of international institutions to address social, political, economic, and cultural changes in global society.

Fulfills general education requirement in global understanding.

Notes: Students may not receive credit for both SOCI 120 and GLOA 101.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 300 - Social Control and Freedom

Credits: 3 (NR)
Explores ways in which individuals are both architects and prisoners of society. Offers a foundational course for examining the “invisible” social forces that shape our lives and the individual and collective capacity to make choices, including social and cultural change. Includes topics such as youth and culture, deviance and crime, social inequalities, and global change.
**SOCI 301 - Criminology**

Credits: 3 (NR)
Focuses on causes and meaning of crime, with emphasis on adults. Patterns of criminal behavior, including property crimes, violent crimes, organized crime, white-collar crime, and victimless crime. Critical assessment of criminal justice system as a response to crime.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 302 - Sociology of Delinquency**

Credits: 3 (NR)
Examines social factors involved in development of delinquency, including family, political economy, schooling, community environment and culture. Examines various theories of delinquency; rates of delinquency in relation to age, race, gender and social class; and legal system that addresses causes, consequences, and policies of punishment and rehabilitation.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 303 - Sociological Research Methodology**

Credits: 4 (NR)
Introduces empirical design in sociological research: historical development, research design, sampling, methods of gathering data, sociometric scales, analysis and interpretation of results, and research reporting.

**Prerequisite(s):** SOCI 101 or 102, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 2

**SOCI 304 - The Future of Work**

Credits: 3 (NR)
Introduces the basic concepts of economic sociology. Explores how the world of work has changed due to globalization, deindustrialization, new technologies, and economic crisis. Focuses on providing students with a better understanding of how markets and corporations work, and about new economic approaches to create new, potentially less alienating work environments.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
**SOCI 307 - Social Movements and Political Protest**

Credits: 3 (NR)
Explores processes for organizing resistance to current social and power arrangements, from terrorism to nonviolent civil resistance to create alternative institutions, policies, or leadership that promote human rights and social justice. Uses historical and contemporary case studies of local and global change to explore, how, why, and to what effect individuals have organized to protest the status quo and create social change.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 308 - Race and Ethnicity in a Changing World**

Credits: 3 (NR)
Explores how race and ethnicity have been shaped by policies and practices in Western and non-Western societies. Explores the evolution of racial and ethnic attitudes from a global and historical perspective. Examines how changing demographic racial patterns may affect definitions of race and ethnicity and the ways in which people individually and collectively act to create new futures.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 309 - Marriage, Families, and Intimate Life**

Credits: 3 (NR)
Uses a sociological framework to analyze and understand the diverse forms of contemporary families--traditional marriages, cohabitation, domestic partnerships, single-parents families, stepfamilies, and gay and lesbian families. Explored are topics such as changes in sexual mores, reflected in new dating practices; shifting parenting roles; effects of social class, race and ethnicity; and the outcomes of divorce for couples and children.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 310 - Sociology of Deviance**

Credits: 3 (NR)
Analyzes macro- and microlevel deviance-producing processes, meaning and control of deviance, and major theoretical approaches to deviance.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**SOCI 311 - Classical Sociological Theory**

Credits: 3 (NR)
Explores sociological tradition through readings and discussions of ideas drawn from writings of selected sociological thinkers such as Comte, Marx, Weber, Durkheim, and others.

Prerequisite(s): 6 credits of upper level (300 or 400 level) sociology courses, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 312 - Qualitative Research Methods**

Credits: 3 (NR)
Introduces ethnography, field work methods, interviewing, life histories, and other qualitative methods to generate data about cultures in which various groups and classes are immersed. Students learn by applying qualitative methods to term projects, developed under guidance of instructor.

Prerequisite(s): 9 credits of sociology including SOCI 101 or 102, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 313 - Statistics for the Behavioral Sciences**

Credits: 4 (NR)
Fundamentals of applied statistics as used in behavioral science to include descriptive statistics, inferential statistics, correlation regression, analysis of variance, factor analysis, nonparametric statistics, and practical experience with calculators in applying statistical analysis to actual problems of the behavioral sciences.

Prerequisite(s): SOCI 101, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 2

**SOCI 314 - The Practice and Politics of Culture**

Credits: 3 (NR)
Examines how culture, encompassing high art or participatory culture, expressive agency or traditional constraint, is produced and reproduced in everyday social practices and across a wide range of social institutions. Explores the role of culture in public life and political discourse.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SOCl 315 - Women and Men in Society

Credits: 3 (NR)
Analyzes the roles of men and women in contemporary American society. Focuses on the perpetuation of and change in gender stratification using sociological concepts, theories, and research. Elucidates how gender expectations are developed and transmitted. Uses historical and comparative data and research on diversity in American society for analysis of causes and consequences of gender inequality.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCl 320 - Social Structure and Globalization

Credits: 3 (NR)

While focusing on nature and process of change in human society, considers social impact of political, economic, and environmental change and how lives are shaped by complexities of global social forces. Examines specific global issues such as conflict and security; economic disparity; ecological deterioration; populations and migration; legitimization of commerce; diffusion of innovations; and impact of class, status, and power in modern societies.

Designated a Green Leaf Course.

Fulfills general education requirement in global understanding.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCl 326 - Armed Conflict and Conflict Resolution

Credits: 3 (NR)
Examines political, economic, and sociocultural reasons why countries engage in armed conflict. Conflicts within and between states are explored with special focus on consequences for global, regional and local instability, loss of life and limb, and fragmentation of social, political, and economic fabric of societies. Examines various approaches to conflict resolution.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCl 332 - The Urban World

Credits: 3 (NR)
Examines cities and the people who live in them in the United States and around the world. Includes topics such as: social and economic development, inequality, political protests, urban democracy, and the environment.

Fulfills general education requirement in global understanding.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**SOCI 340 - Power, Politics, and Society**

Credits: 3 (NR)
Analyzes how power is defined, attained and sustained in society. Students analyze political power as related to social realities such as democratic elections, class conflict, elite networks, powersharing, protest, and revolution.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 352 - Social Problems**

Credits: 3 (NR)
Using a sociological perspective, analyzes the problems of contemporary societies, including inequality, poverty, health, environment, oligarchy, media, militarism, and corruption.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 355 - Social Inequality**

Credits: 3 (NR)
Studies class structures and implications for individuals and groups in modern society. Explores issues of race and ethnicity, language and immigration status, sex and gender, social class, age, and sexual orientation. Examines critically the theory and research that explore the construction, experience, and meaning of such differences.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 360 - Youth Culture and Society**

Credits: 3 (NR)
Introduces sociology of youth and youth culture. Investigates social, economic, and political realities of youth as a group and different groups of youth, including youth cultural production, formation of youth culture, and youth identities in variety of social settings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 373 - The Community**

Credits: 3 (NR)
Examines small to moderate-size communities ranging through village, rural community, small town, and city subcommunity.
Latter category includes city localities, ethnic villages, and suburban communities.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 377 - Art and Society**

Credits: 3 (NR)  
Introduces the many ways in which art reflects social tendencies, comments on social problems, and contributes to discussions about a wide range of social issues. Students attend theatrical performances and visit exhibition spaces on campus, and learn to analyze what they experience through both aesthetic and sociological approaches. Explores contemporary issues such as debates about artistic freedom and public morality, commercialization of art, and relationship between cultural and social hierarchies.

Fulfills general education requirement in synthesis.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 382 - Education in Contemporary Society**

Credits: 3 (NR)  
Examines classrooms and schools as social institutions that function as socializing agents for both stability and societal change. Emphasizes the influence of inequality on educational processes and outcomes and critically examines the social organization of the U.S. public school system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 385 - Sociology of Religion**

Credits: 3 (NR)  
Studies places of religious consciousness in human action and institutional and organizational networks created to sustain religious beliefs. Emphasizes comparative and historical analysis of role religion has played in human society. Examines theories of nature of religious experience, religious symbolism, and basis of religious community. Explores changing demographics in relation to older traditional religious faiths and newer nontraditional faiths.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 390 - Sociology of Health, Illness, and Disability**

Credits: 3 (NR)  
Examines social context of health, illness, and disability; relationships of health care professionals and patients; and structure and delivery of health care in different medical systems.
SOCI 395 - Special Topics in Sociology

Credits: 3 (RT)
Introduces the research interests of the faculty, offering new courses that reflect current issues not yet incorporated into the curriculum. Offers, in addition, advanced study into topics covered in the standing curriculum. Topics change by semester.

Prerequisite(s): 90 credits, and 12 credits of sociology.

SOCI 399 - Independent Study

Credits: 1-3 (RD)
Individual study of sociological topic of interest to student.

Prerequisite(s): Open to sociology majors only. 6 credits of sociology including SOCI 101, and approval of written proposal.

Notes: May be repeated for credit up to 3 credits.

SOCI 405 - Analysis of Social Data

Credits: 4 (NR)
Overview of management and analysis of empirical social science data, including file construction, scaling and measurement, data transformation, and treatment of missing data. Emphasizes manipulation, management, and analysis of data sets using computers.

Prerequisite(s): 60 credits, SOCI 313 or permission of instructor.

SOCI 410 - Social Surveys and Attitude and Opinion Measurements

Credits: 3 (NR)
Surveys research methods and techniques to collect, measure, and analyze social data, attitudes, and opinions with special emphasis on using computer software, the Internet, and other information technologies for social research. Highlights ethical
issues for social research, computing, and information technology.

Fulfills general education requirement in information technology (all except ethics).

Prerequisite(s): SOCI 303 and 313 or equivalents, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 412 - Contemporary Sociological Theory**

Credits: 3 (NR)

Presents for analysis and discussion the significant theorists and themes in contemporary sociological theory. Designed to enhance student’s skills in reading and analyzing primary texts and to encourage reflection on contemporary social reality. Fulfills writing intensive requirement.

Fulfills writing intensive requirement in the major.

Prerequisite(s): SOCI 311 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 416 - Internship in Sociology**

Credits: 1-6 (RT)

Intended to promote learning in application of sociological knowledge, and build skills in different work settings. Students work in approved setting as applied sociologists.

Prerequisite(s): 21 credits of sociology, including Research Methods, or permission of instructor.

Notes: Minimum 45 hours of work for each credit required. May be repeated for a maximum of 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

**SOCI 421 - Field Work in Social Change**

Credits: 3 (NR)

In-depth investigation of planned social change through field work internship with change organization of student's choice. Groups may be involved in influencing peace, environment, civil rights, consumer protection, poverty, or other public issues. Topics include ideologies, targets, organizational structures, opposition, and strategies of change.

Prerequisite(s): 6 credits of sociology or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**SOCI 441 - The Sociology of Aging**

Credits: 3 (NR)
Aging from a sociological perspective. Topics include demographic trends and aging population in America, social construction of life stages and creation of "old age," cultural labeling, and human resistance.

**Prerequisite(s):** 6 credits of sociology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 471 - Prevention and Deterrence of Crime**

Credits: 3 (NR)

Equivalent to CRIM 471

**Prerequisite(s):** 60 credits, in-service status, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 480 - Honors Seminar in Sociology I**

Credits: 3 (NR)
Develop research proposals and an appropriate bibliography for honors thesis under the guidance of a sociology faculty member.

**Prerequisite(s):** Admission to honors in the sociology major.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Special undergraduate.

**SOCI 481 - Honors Seminar in Sociology II**

Credits: 3 (NR)
Pursue independent research and write honors thesis under the guidance of a faculty mentor. Present work in a colloquium at the end of the semester.

**Prerequisite(s):** Successful completion of SOCI 480.
SOCI 482 - Honors Internship in Sociology

Credits: 3 (NR)
Provides hands-on experience in sociology and opportunity to do research in approved work settings. In addition to 120 hours of field work (for 3 credits), students meet at discretion of instructor to plan their research and share ongoing field work experiences.

Prerequisite(s): Admission to Sociology Honors Program and permission of instructor.

SOCI 483 - The Sociology of Higher Education

Credits: 3 (NR)
Exposes students to sociological theory and research on evolution of higher learning in United States. Explores social forces that have shaped the distinctively American approach toward higher education and have led to transformation of higher education in contemporary society. Particular attention to relation between universities and elites within surrounding society, linkage between education and industry, norms and values that are presupposed by educational institutions, and bearing of sports on values and traditions of higher education.

Fulfills general education requirement in synthesis.

Prerequisite(s): 60 credits.

SOCI 492 - Sociology of Organizations

Credits: 3 (NR)
Theories, analysis of types of organizations from informal voluntary associations to large complex ones. Explores nonprofit organizations and alternatives to bureaucracies, such as feminist collectives, cooperatives, self-help groups, and social movement organizations. Students do field work in organizations applying theories and concepts to observations.

SOCI 499 - Independent Research in Sociology
Investigation of sociological problem according to individual interest, with emphasis on research.

**Prerequisite(s):** 18 credits of sociology including SOCI 311, 313, and 412; 3.00 GPA in sociology; and research proposal approved by instructor and department chair before enrollment.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 0

### SOCI 503 - Sociology of Law

Credits: 3 (NR)  
Classical and contemporary sociological theories applied to law and legal institutions. Social relations between law and community, special group interests, social change, and social deviance. Case studies. Consideration of legal profession.

**Prerequisite(s):** Undergraduate senior status in sociology, graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### SOCI 516 - Internship in Sociology

Credits: 1-6 (RD)  
Learning experience in the application of sociological knowledge and skills in different work settings. Students work in approved setting as applied sociologists.

**Prerequisite(s):** 21 credits of sociology including research methods, or permission of instructor.

**Notes:** Minimum 45 hours of work for every 1 credit. May be repeated for a maximum of 6 credits.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

### SOCI 590 - Gender, Race, and the Natural World

Credits: 3 (NR)  
Advanced study of links among gender, race, and nature using social-psychological framework, original sources, and seminar discussion format. Analyzes ideologies that underpin interlocking narratives of gender, race, and nature; and examines role of science in production of those ideologies.

**Prerequisite(s):** Undergraduate seniors, graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
SOCl 599 - Issues in Sociology

Credits: 1-3 (NR)
Contemporary topics in sociology including sociological theory, crime and delinquency, advanced research methods, social and cultural change, urban sociology, medical sociology, sociology of aging, and rural sociology.

Equivalent to NURS 611

Prerequisite(s): Undergraduate senior status in sociology, or graduate status.

Notes: May be taken only once for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCl 605 - Gender and Social Structure

Credits: 3 (NR)
Reviews theories explaining the development and maintenance of gender. Using historical and comparative data, examines perceived, prescribed, and actual sex differentiation in social, political, and economic roles. Begins with gender as a social structure and then examines contemporary research as support or refutation for variety of theoretical paradigms. Includes discussion of gender in intimate relationship and the public sector.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCl 607 - Criminology

Credits: 3 (NR)
Crime and crime causation. Topics include social basis of law, administration of justice, and control and prevention of crime.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCl 608 - Juvenile Delinquency

Credits: 3 (NR)
Sociology of adolescent behavior. Sociological factors that determine which behaviors and social categories of adolescents are likely to be labeled and treated as delinquent.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SOCI 609 - Sociology of Punishment and Corrections

Credits: 3 (NR)
Explores development of modern penal system as interpreted by various perspectives, including Durkheim, Marx, Weber, Foucault, Elias, and Garland. Explores recent trends and problems, including social control and violence in prisons, race and gender disparities in punishment, alternative rehabilitation, and prevention strategies.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 614 - Sociology of Culture

Credits: 3 (NR)
Analyzes 20th-century debates in American culture and cultural politics, with emphasis on art and popular culture, news media, and competing notions of "the public." In-depth readings in cultural sociology cover variety of theoretical and methodological approaches.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 619 - Conflict and Conflict Management: Perspectives from Sociology

Credits: 3 (NR)
Deals with sociology of conflict. Presents major sociological theories of conflict such as those of Marx, Weber, Simmel, Dahrendorf, Coser, and Collins. Stresses role that sociological conflict theory plays in undergirding conflict management practices.

Prerequisite(s): Graduate standing in sociology or conflict analysis and resolution, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 620 - Methods and Logic of Social Inquiry

Credits: 3 (NR)
Emphasizes gathering, interpreting, and evaluating scientific evidence. Covers logic of scientific inquiry, including the application of various research designs and data collection methods. Develops critical-thinking skills by using set of rules and logical criteria for evaluation of social science research. Focuses both on how results are obtained and disseminated via research reports.
Prerequisite(s): Undergraduate statistics and research methodology, or permission of instructor.

Notes: Restricted to SOCI majors only.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 623 - Racial and Ethnic Relations: American and Selected Global Perspectives

Credits: 3 (NR)
Covers demographic purview of U.S. and other global racial and ethnic groups and racial and ethnic groups as human-social-minority and dominant groups. Explores factors contributing to dominant and minority status and means of altering dominant groups assessment of minority group status.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SOCI 631 - Survey Research

Credits: 3 (NR)
Introduces theory, method, and practice of survey research design and analysis. Students complete survey research project.

Prerequisite(s): SOCI 530 and 531, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 632 - Evaluation Research for Social Programs

Credits: 3 (NR)
Studies methodological issues related to evaluation of social programs. Explores conceptual and research design issues in relation to social programs, particularly delivery of social services. Includes examination of methods used to assess need for programs, impact of delivery systems, and efficiency and effectiveness of social programs.

Prerequisite(s): SOCI 530 and 531, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 633 - Special Topics in Sociology

Credits: 3 (RT)
Specialized inquiry of topics of contemporary sociological research and scholarship. Content varies.
Notes: May be repeated for credit when topic varies for a maximum of 12 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 634 - Qualitative Research Methods

Credits: 3 (NR)
Examines basic research methods involving observational techniques and procedures used in description and analysis of patterns, configurations, ethos, eidos, structures, functions, and styles typical of whole societies and cultures. Emphasizes case studies, unobtrusive methods, participant observation, longterm residence, choices of observer status role, recording data, uses of technical equipment, key informants, interviewing techniques, and ethical considerations in employing such methods and procedures.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 635 - Environment and Society

Credits: 3 (NR)
Overview of human ecology and environmental sociology, emphasizing selected topics. Focuses on theory, since theory makes it possible to generalize from understandings derived in an analysis of a particular problem and apply them to other problems.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 636 - Statistical Reasoning

Credits: 3 (NR)
Intermediate treatment of quantitative analytic techniques used in sociology. Topics include sampling, inference, hypothesis testing, analysis of variance, and bivariate and multiple correlation and regression. Introduces logic of multivariate analysis. Focus on how results are obtained and disseminated via research reports.

Prerequisite(s): Undergraduate statistics and research methodology, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 640 - Social Theory and Social Policy
Major theories of social organization and social change as means of understanding social policy development. Concentration is on social policies in American society.

Prerequisite(s): Graduate standing, or permission of instructor.

SOCI 651 - Health Care Systems

Credits: 3 (NR)
Changing health care systems are rapidly affecting patient providers and health and quality of life of society. Offers analysis and theories of change in health care systems and impacts on society and various stakeholders. Examines for-profit and nonprofit organizations and their impacts, and offers comparative cross-cultural analysis of health care systems.

Prerequisite(s): Graduate standing, or permission of instructor.

SOCI 660 - Historical and Comparative Sociology

Credits: 3 (NR)
Seminar in theory and methods of historical and comparative sociology, primarily for students with background in sociological theory and methods. Examines basic approaches and research data of history and sociology, surveys development of field, and analyzes exemplary studies.

Prerequisite(s): Graduate standing, or permission of instructor.

SOCI 686 - Sociology of Aging

Credits: 3 (NR)
Analyzes sociological issues in aging, including class and cultural factors, problems of work, retirement, attachment and loss, and ageism. Examines different theories of aging.

Prerequisite(s): Graduate standing, or permission of instructor.

SOCI 696 - Independent Study
SOCI 697 - Independent Study

Credits: 1-3 (RD)
Theoretical and research literature chosen by student and instructor.
Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

SOCI 711 - Classical Sociological Theory

Credits: 3 (NR)
In-depth examination of major issues in classical (pre-1930) sociological theory. Analyzes Durkheim, Marx, Weber, Mead, and others, and emphasizes social and intellectual context of their theories.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 712 - Contemporary Sociological Theory

Credits: 3 (NR)
Examines schools in contemporary sociological theory such as structural-functionalism, conflict, exchange, symbolic interactionism, ethnomethodology, humanist sociology, and critical theory. Analyzes contemporary theorists in relation to schools.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOCI 730 - Analytic Techniques of Social Research

Credits: 3 (NR)
Introduces multiple regression and causal analysis to sociological researchers, with a focus on obtaining and disseminating results. Moves from linear regression to the general linear model with several variables, its extensions, assumptions, and
regression diagnostics. Examines the use of dummy variable and the analysis of interaction effects. Considers systems of equations and nonlinear outcomes.

**Prerequisite(s):** Undergraduate statistics and research methodology, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SOCI 797 - Sociology Colloquium**

Credits: 0 (RD)  
Public forum for the presentation and discussion of contemporary sociological research.

**Prerequisite(s):** Admission to graduate program in sociology or permission of graduate director.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No credit only

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**SOCI 799 - Thesis**

Credits: 1-6 (RD)  
Master’s thesis research under direction of thesis committee.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

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**SOCI 801 - Proseminar in Public and Applied Sociology**

Credits: 3 (NR)  
The first of a two-semester core sequence devoted to the philosophical, historical, theoretical, and methodological dimensions of public and applied sociology within the United States. Traces the evolution of the field during the 20th century, from its inception in the Chicago school and the studies of W.E.B. DuBois to more recent formulations, as these bear on the interplay between social scientific knowledge and public decisions and debates.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SOCI 803 - Institutions and Inequality**

Credits: 3 (NR)  
Analyzes the interrelations between social inequalities and institutional structures, including markets, the press, prisons, mental institutions, cultural organizations, and corporations.
**SOCI 804 - Sociology of Globalization**

Credits: 3 (NR)
Addresses the social, political, cultural, and economic process of globalization. Explores the limits on globalization during the precapitalist era, the relation between empire and the internal structure of imperialist societies, theoretical debates over the contemporary world system, the relation between cities and globalization, and the link between globalization and social inequality within both developed and developing societies.

**SOCI 833 - Special Topics in Sociology**

Credits: 3 (RD)
Specialized inquiry of topics of contemporary sociological research and scholarship. Content varies.

**Prerequisite(s):** Have completed either 6 credits of coursework at the 600 level or permission of instructor.

**Notes:** May be repeated when topic is different for a maximum of 9 credits.

**SOCI 840 - Work Organizations and Social Inequality**

Credits: 3 (NR)
Examines the social, organizational, and cultural processes that account for the differential distribution of job rewards along class, gender, and racial and ethnic lines. Topics include the historical evolution of the management worker relationship, job segregation by race and gender, the effect of new technologies on social inequality, the relation between gender and professional careers, the efficacy of governmental efforts to ensure equal opportunity, and the effect of organizational change on racial and gender inequalities at work.

**SOCI 844 - Youth, Schooling, and Popular Culture**

Credits: 3 (NR)
Uses sociological perspectives to understand the various ways in which popular youth culture, schooling processes, and consumer
culture intersect in contemporary American cultural life. Examines the social, economic, and political realities of youth as a group and the formation of distinct youth cultures within and outside formal school settings, including schooling and commodity culture, how markets promote and hinder particular educational ideologies, and how corner markets operate as spaces of cultural learning.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 845 - Society and Education**

Credits: 3 (NR)
Exposes students to the major theories, debates, and findings within the sociology of education, emphasizing the reciprocal influences of schooling and social inequalities within contemporary societies. Emphasis on the historical evolution of public schooling in the United States, the complex relation between schooling and economic institutions, class differences in educational opportunity, and the politics of educational reform.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 850 - Sociology of Development**

Credits: 3 (NR)
Analyzes socioeconomic and political change, focusing on the poor countries of Asia, Africa, and Latin America. Offers a basic descriptive understanding of processes of change in these countries and an introduction to major theoretical perspectives on development and globalization, from classical theories of comparative advantage to theories of imperialism, modernization, dependency, and globalization.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 851 - Globalization and Social Movements**

Credits: 3 (NR)
Analyzes current issues in the study of social movements, with an emphasis on the ways in which globalization shapes and in turn is shaped by social movements. Emphasis is placed on the relations among the strategies, identities, and organizations bound up with transnational social movements and the relation between the dynamics of global political and economic developments and protest movements in core and peripheral societies.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SOCI 853 - Cities in a Global Society**
Examines the scholarly literature on cities and globalization with a focus on the impact of globalization on urban environments and the effects of urbanization on the processes of globalization. Emphasis on the ways in which globalization restructures urban life in the core and periphery of the world economy with attention paid to the effects of spatial dispersion on the character of economic institutions within the advanced societies, the shifting nature of crime and security, immigration, and the cities of the Global South.

**SOCI 857 - Sociology of Human Rights**

Credits: 3 (NR)
Examines the connections among inequality, conflict, social justice, and human rights in an age of globalization. Drawing from case studies from around the world, the course examines institutional and structural violence and inequality as they relate to state, corporate, and military power; international law and order; welfare and social policy; global justice; regionalism, multilateralism, and transnationalism; environmental protection; gender inequality; ethnic conflict; resource wars; and national security policy before and after September 11, 2001.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 860 - Historical and Comparative Sociology**

Credits: 3 (NR)
Seminar in theory and methods of historical and comparative sociology, primarily for students with background in sociological theory and methods. Examines basic approaches and research data of history and sociology, surveys development of field, and analyzes exemplary studies.

**Prerequisite(s):** Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SOCI 870 - Directed Readings Sociology**

Credits: 3 (RD)
Intensive reading course to develop comprehensive understanding of specific field in sociology as agreed on with advisor.

**Prerequisite(s):** 6 credits of 600-level SOCI courses.

**Notes:** Content varies. May be repeated.
SOCI 880 - Independent Study in Sociology

Credits: 3 (RD)
Reading and research on selected topic, resulting in a written project as agreed on with supervising faculty.

Prerequisite(s): 6 credits of 600-level SOCI courses

Notes: Content varies. May be repeated.

SOCI 998 - Doctoral Dissertation Proposal

Credits: 1-9 (RD)
Work on research proposal for doctoral dissertation.

Prerequisite(s): Completion of all but final year of coursework and permission of graduate director.

Corequisite(s): Advanced grad students may enroll in 998 during final year of coursework and before completion of comprehensive exams.

Notes: May be repeated. A maximum of 9 credits of 998 may be applied to the degree. Students may enroll in 998 in their final year of coursework while preparing for comprehensive exams.

SOCI 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Doctoral dissertation research and writing on approved dissertation topic under direction of committee.

Prerequisite(s): Successful completion of SOCI 998.

Notes: Maximum of 12 credits may be applied toward degree.
Sociology and Anthropology (SOAN)

Offered by the College of Humanities and Social Sciences

SOAN 500 - Communicating across the Disciplines

Credits: 3 (NR)
Provides an introduction to the range of disciplinary perspectives and their combinations necessary for analyzing and acting on critical research policy needs in the global arena. Using case examples from recent and contemporary events, students will analyze data, assess alternative policy and program approaches, and evaluate the relative contributions of different disciplines and fields, including the way those disciplines and fields vary across different national traditions and between the national and international levels.

Prerequisite(s): Admission to MAIS concentration in global interaction.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOAN 510 - Culture and Globalization

Credits: 3 (NR)
Provides continuing exposure to the range of disciplinary perspectives necessary for understanding crucial issues in the global arena. Through case examples, focuses on the intersections of culture and globalization. Analyzes existing data and assesses alternative policy and program approaches, and illuminates interactions between globalization and culture.

Prerequisite(s): SOAN 500

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SOAN 670 - Special Topics in Sociology and Anthropology

Credits: 4-8 (NR)
Provides cross-disciplinary, pedagogical format in Department of Sociology and Anthropology. Covers variety of pedagogical formats, such as combining ethnographic field techniques taught in anthropology with sociological-based urban issues, or providing archaeological laboratory analyses with grounding in statistical techniques proposed by department faculty.

Prerequisite(s): Graduate standing, or permission of instructor.

Hours of Lecture or Seminar per week: 0-8
Hours of Lab or Studio per week: 0-8

Software Engineering (SWE)
Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.

**SWE 205 - Software Usability Analysis and Design**

Credits: 3 (NR)
Principles of user interface design. Concepts for objectively and quantitatively assessing the usability of software user interfaces. Outcomes include knowledge of quantitative engineering principles for designing usable software interfaces and an understanding that usability is more important than efficiency for almost all modern software projects, and often the primary factor that leads to product success. Major topics include cognitive models for human perceptions and needs, which are used as a basis for analytical and critical thinking about user interfaces; specific engineering principles for designing usable menus, forms, command languages, web sites, graphical user interfaces and web-based user interfaces. Assessments will include written analytical evaluations of existing user interfaces, exams, and HTML-based design projects.

Prerequisite(s): ENGL 101/ENGH 101

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SWE 301 - Internship Preparation**

Credits: 0 (NR)
Preparation for Internship Educational Experience. Intended for, but not limited to, students planning internships in the Applied Computer Science Software Engineering Program. Internship employment opportunities. Basic interview skills. Techniques for applying academic knowledge to practical software development. Techniques for extracting knowledge from practical experience. Peer presentation from students who have completed internships.

Prerequisite(s): Limited to ACS or CS majors with junior standing or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

**SWE 321 - Software Requirements and Design Modeling**

Credits: 3 (NR)
An introduction to concepts, methods, and tools for the creation of large-scale software systems. Methods, tools, notations, and validation techniques to analyze, specify, prototype, and maintain software requirements. Introduction to object-oriented requirements modeling, including use of case modeling, static modeling, and dynamic modeling using the Unified Modeling Language (UML) notation. Concepts and methods for the design of large-scale software systems. Fundamental design concepts and design notations are introduced. A study of object-oriented analysis and design modeling using the UML notation. Students participate in a group project on software requirements, specification, and object-oriented software design.

Equivalent to CS 321 (2011-2012 Catalog); SWE 421 (2010-2011 Catalog)
**SWE 332 - Object-Oriented Software Design and Implementation**

Credits: 3 (NR)

In-depth study of software design and implementation using a modern, object-oriented language with support for graphical user interfaces and complex data structures. Topics covered are specifications, design patterns, and abstraction techniques, including typing, access control, inheritance, and polymorphism. Students will learn the proper engineering use of techniques such as information hiding, classes, objects, inheritance, exception handling, event-based systems, and concurrency.

Equivalent to CS 332

**Prerequisite(s):** Grade of C or better in CS 211 Prerequisite enforced by registration system.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SWE 401 - Internship Reflection**

Credits: 1 (NR)

Reflection on Internship Educational Experience. Intended for, but not limited to, students completing internships in the Applied Computer Science Software Engineering Program. Analysis of techniques for applying academic knowledge to practical software development. Analysis of techniques for extracting knowledge from practical experience. Student presentations summarizing internships relating them to academic program goals.

**Prerequisite(s):** SWE 301 and completion of internship

**Hours of Lecture or Seminar per week:** 1
**Hours of Lab or Studio per week:** 0
**Grading:** Satisfactory/No credit only

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**SWE 432 - Design and Implementation of Software for the Web**

Credits: 3 (NR)

Teaches how to develop software for web applications. Covers client-server computing, theories of usable graphical user interfaces, and models for web-based information retrieval and processing. Goals are to understand how to design usable software interfaces and implement them on web, learn how to build software that accepts information from users across web and returns data to user, and understand how to interact with database engines to store and retrieve information. Specific topics are HTML, CGI programming, Java, Java applets, Javascripts, and Java servlets.

**Prerequisite(s):** Grade of C or better in MATH 125 and CS 211. Prerequisite enforced by registration system.
SWE 437 - Software Testing and Maintenance

Credits: 3 (NR)
Concepts and techniques for testing and modifying software in evolving environments. Topics include software testing at the unit, module, subsystem, and system levels; developer testing; automatic and manual techniques for generating test data; testing concurrent and distributed software; designing and implementing software to increase maintainability and reuse; evaluating software for change; and validating software changes.

Prerequisite(s): Grade of C or better in CS 211 and MATH 125

SWE 443 - Software Architectures

Credits: 3 (NR)
Teaches how to design, understand, and evaluate software systems at an architectural level of abstraction. By end of course, students will be able to recognize major architectural styles in existing software systems, describe a system's architecture accurately, generate architectural alternatives to address a problem and choose from among them, design a medium-size software system that satisfies a specification of requirements, use existing tools to expedite software design, and evaluate the suitability of a given architecture in meeting a set of system requirements.

Prerequisite(s): Grade of C or better in CS 321 or CS 421 or SWE 321 or SWE 421. Prerequisite enforced by registration system.

SWE 510 - Object-Oriented Programming in Java

Credits: 3 (NR)
Introduces students to programming in the Java language. Topics include problem-solving methods and algorithm development, program structures, abstract data types, simple data and file structures and program development in a modular, object-oriented manner. Introductory use of OO language features, including data hiding, inheritance, polymorphism, and exception handling. Goals include design and development of Java classes and class type hierarchies. An introduction to Java servlets and applets is included. Emphasis on program development is reinforced through several programming projects.

Prerequisite(s): Undergraduate courses or equivalent knowledge in programming in a high-level language.

Notes: Credit cannot be applied to a graduate degree in the Volgenau School or the BS degree in computer science.
SWE 521 - Software Engineering Essentials

Credits: 3 (NR)
Provides an overview of essential topics in software engineering, including problem solving with computers, requirements, software design, software development, testing, verification, validation, usability, and management. The course will also discuss concepts related to building software, including data structures, object-oriented programming, event handling in GUIs, and web application technologies. The course will discuss how these concepts are handled in various languages, but without requiring the students to program. Credit cannot be applied to any degree in the computer science department.

Equivalent to AIT 521

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

SWE 619 - Object-Oriented Software Specification and Construction

Credits: 3 (NR)
In-depth study of software construction using modern, object-oriented language with support for graphical user interfaces and complex data structures. Specifications, design patterns, and abstraction techniques, including procedural, data, iteration, type, and polymorphic. Information hiding, classes, objects, and inheritance. Exception handling, event-based systems, and concurrency.

Prerequisite(s): SWE foundation courses or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 620 - Software Requirements Analysis and Specification

Credits: 3 (NR)
In-depth study of object-oriented requirements modeling, including use case modeling, static modeling and dynamic modeling with Unified Modeling Language (UML) notation. Students participate in group project on software requirements and specification using modern method.

Prerequisite(s): SWE foundation courses or equivalent

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 621 - Software Modeling and Architectural Design
Concepts and methods for the architectural design of large-scale software systems are presented. Fundamental design concepts and design notations are introduced. Concepts of requirements analysis and specification are taught. Several design methods are presented and compared. In-depth study of object-oriented analysis and design modeling using the Unified Modeling Language (UML) notation. Students participate in a group project on software requirements, analysis, and design modeling.

Prerequisite(s): SWE 619 or permission of instructor. MSCS students may substitute CS 540 and CS 571 for SWE 619.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 622 - Distributed Software Engineering

Credits: 3 (NR)
Hands-on introduction to techniques and programming interfaces for distributed software engineering. Networking protocols at several layers. Construction of distributed and concurrent software using network protocol services. Applications of Internet and web-based software.

Prerequisite(s): SWE foundation courses or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 623 - Formal Methods and Models in Software Engineering

Credits: 3 (NR)
Formal mechanisms for specifying, validating, and verifying software systems. Program verification through Hoare's method and Dijkstra's weakest preconditions. Formal specification via algebraic specifications and abstract model specifications, including initial specification and refinement toward implementation. Integration of formal methods with existing programming languages, and the application of formal methods to requirements analysis, testing, safety analysis, and object-oriented approaches. Formal methods using the Object Constraint Language (OCL).

Prerequisite(s): SWE 619, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 625 - Software Project Management

Credits: 3 (NR)
Lifecycle and process models; process metrics; planning for a software project; mechanisms for monitoring and controlling schedule, budget, quality, and productivity; and leadership, motivation, and team building.

Prerequisite(s): SWE foundation courses or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SWE 626 - Software Project Laboratory

Credits: 3 (NR)
Covers requirements analysis, design, implementation, and management of software development project. Students work in teams to develop or modify software product, applying sound principles of software engineering. Uses both industrial and academic standards to assess quality of work products.

Prerequisite(s): SWE 619, 620, and 621; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 6

SWE 630 - Software Engineering Economics

Credits: 3 (NR)
Covers quantitative models of software lifecycle, cost-effectiveness analysis in software engineering, multiple-goal decision analysis, uncertainty and risk analysis, software cost estimation, software engineering metrics, and quantitative lifecycle management techniques.

Prerequisite(s): SWE 625

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 631 - Object-Oriented Design Patterns

Credits: 3 (NR)
Principles of object-oriented design through design patterns. Studies selection of appropriate object-oriented structure after system requirements or requirements specification of software system have been developed. Design patterns created in logic view of software system. Studies generalized design solutions for generalized software design problems, and reuse of design patterns. Once developed, design patterns may be specified in any object-oriented language.

Equivalent to CS 631

Prerequisite(s): SWE 619 or 621, or CS 540 or 571; or graduate course in object-oriented programming or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 632 - User Interface Design and Development

Credits: 3 (NR)
Principles of user interface design, development, and programming. Includes user psychology and cognitive science, menu system design, command language design, icon and window design, graphical user interfaces, web-based user interfaces.
**Prerequisite(s):** SWE 619, or CS 540 and 571, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SWE 637 - Software Testing**

Credits: 3 (NR)

Students learn to test software effectively. Programmers learn practical ways to design high quality tests during all phases of software development. Students learn the theory behind criteria-based test design and to apply that theory in practice. Topics include test design, test automation, test coverage criteria, and how to test software in cutting-edge software development environments.

**Prerequisite(s):** SWE 619, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SWE 641 - Systems Architecture for Large-Scale Systems**

Credits: 3 (NR)

See SYST 621.

Equivalent to SYST 621

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SWE 642 - Software Engineering for the World Wide Web**

Credits: 3 (NR)

Detailed study of engineering methods and technologies for building highly interactive web sites for e-commerce and other web-based applications. Presents engineering principles for building web sites that exhibit high reliability, usability, security, availability, scalability, and maintainability. Teaches methods such as clientserver programming, component-based software development, middleware, and reusable components.

**Prerequisite(s):** SWE 619, or CS 540 and 571, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SWE 645 - Component-Based Software Development**
Introduces concepts and foundations of software component and component-based software. Detailed study of engineering principles of modeling, designing, implementing, testing, and deploying component-based software. Also explores state-of-the-art component technologies.

**Prerequisite(s):** SWE 619, or CS 540 and CS 571, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SWE 699 - Special Topics in Software Engineering**

Credits: 3 (RT)  
Special topics not occurring in regular SWE sequence.

**Prerequisite(s):** Permission of instructor.

**Notes:** May be repeated for credit when semester topic is different.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SWE 720 - Advanced Software Requirements**

Credits: 3 (NR)  
State-of-the-art and state-of-the-practice in software requirements engineering. In-depth coverage of selected methods, tools, notations, or validation techniques for the analysis and specification of software requirements. Includes project investigating or applying approaches to requirements engineering.

**Prerequisite(s):** SWE 620 and 621.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**SWE 721 - Reusable Software Architectures**

Credits: 3 (NR)  
Investigates software concepts that promote reuse of software architectures. Studies influence of object technology on software design and reuse. Investigates domain modeling methods, which model the application domain as a software product family from which target systems can be configured. Covers reusable software patterns including architecture patterns and design patterns, software components, and object-oriented frameworks.

**Prerequisite(s):** SWE 621

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
SWE 722 - Service Oriented Architecture

Credits: 3 (NR)
This course covers the state-of-the-art approaches to building dependable Service-Oriented Architecture (SOA) software systems. A variety of relevant topics are covered, including SOA design principles, implementation platforms and standards, quality of service contracts, runtime management of service providers, and coordination and composition of services. The course includes a final project to exercise the concepts covered in class.

Prerequisite(s): SWE 622 or instructor’s permission.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

SWE 723 - Precise Modeling

Credits: 3 (NR)
Discusses ongoing advances in modeling techniques for software design, including precision, performance, security and safety aspects, and UML, its meta-models, and proposed enhancements such as Object Security Constraint Language, Object Temporal Constraint Language, QoS Profiles and the theory behind them.

Prerequisite(s): SWE 621

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 727 - Quality of Service for Software Architectures

Credits: 3 (NR)
Builds on acquired skills for modeling architectures, and focuses on the relationship between architectural patterns and qualities of service (QoS). By the end of the course, students will be able to elicit the QoS preferences of stakeholder; recognize major architectural styles and the QoS tradeoffs that each presents; design for and reconcile competing QoS requirements; and evaluate a given architecture with respect to a set of QoS requirements.

Prerequisite(s): SWE 621 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 763 - Software Engineering Experimentation

Credits: 3 (NR)
Detailed study of scientific process, particularly using experimental method. Examines how empirical studies are carried out in software engineering. Reviews distinction between analytical techniques and empirical techniques. Other topics include
experimentation required in software engineering, problems that can be solved using experimentation, methods used to control variables and eliminate bias in experimentation, and analysis and presentation of empirical data for decision making.

Prerequisite(s): SWE 621, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 781 - Secure Software Design and Programming

Credits: 3 (NR)
Theory and practice of software security, focusing in particular on some common software security risks, including buffer overflows, race conditions and random number generation, and on identification of potential threats and vulnerabilities early in design cycle. Emphasizes methodologies and tools for identifying and eliminating security vulnerabilities, techniques to prove absence of vulnerabilities, ways to avoid security holes in new software, and essential guidelines for building secure software: how to design software with security in mind from the ground up and integrate analysis and risk management throughout the software life cycle.

Prerequisite(s): SWE 619, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 795 - Advanced Topics in Software Engineering

Credits: 3 (RD)
Advanced topics not occurring in existing courses. Topics normally assume knowledge in one or more existing MS SWE courses.

Prerequisite(s): 12 credits applicable toward MS program.

Notes: Repeatable within degree for credit when subject differs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SWE 796 - Directed Readings in Software Engineering

Credits: 3 (NR)
Analysis and investigation of contemporary problem in software engineering. Requires prior approval by faculty member who supervises student’s work. Written report also required.

Prerequisite(s): Permission of Department Chair.

Notes: Maximum 6 credits may be earned. To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair.
SWE 798 - Research Project

Credits: 3 (RD)
Master's degree candidates undertake a project using knowledge gained in MS program. Topics chosen in consultation with a faculty sponsor. Research project is chosen under guidance of full-time graduate faculty member, resulting in written technical report.

Prerequisite(s): 18 credits applicable toward MS.

Notes: Prior approval required by faculty sponsor who supervises student's work. To register, students must complete an independent study form available in department office. It must be initialed by the faculty sponsor and approved by the department chair.

SWE 799 - Thesis

Credits: 1-6 (NR)

Research project completed under supervision of faculty member, which results in technical report accepted by three-member faculty committee. Report must be defended in oral presentation.

Prerequisite(s): Permission of Advisor and Department Chair.

Notes: To register, students must complete independent study form available in department office. It must be initialed by faculty sponsor and approved by department chair.

SWE 821 - Software Engineering Seminar

Credits: 3 (RD)
Study of application of software engineering principles, design methods, and support tools through real-life problems extracted from faculty and industry projects.

Prerequisite(s): SWE 621

Notes: May be repeated with change in topic.
Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SWE 823 - Software for Critical Systems

Credits: 3 (NR)
Study of software for systems in which failure can be catastrophic. Presents techniques to construct and analyze software for critical applications and examination of inherent limitations of such techniques, and interaction between techniques used during development and behavior of software during operation. Topics include tolerance of software faults, design redundancy, data redundancy, software safety, formal methods, statistical testing, design for analyzability, and design for testability.

Prerequisite(s): SWE 620 and STAT 554.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SWE 824 - Program Analysis for Software Testing

Credits: 3 (NR)
Different methods for analyzing software, primarily for purpose of testing. Analysis techniques, specific algorithms, tools, and applications. Goals are to explore current research issues, learn how to build software analysis tools, and understand how these techniques can be applied to software development activities. Focuses on applications for testing software, including automatic test data generation, object oriented testing, and testing client-server applications. Also considers analysis techniques for other software-related activities such as maintenance, reuse, object-oriented development metrics and optimization.

Prerequisite(s): A compiler class (e.g., CS 540) or testing class (e.g., SWE 637) or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SWE 825 - Special Topics in Web-Based Software

Credits: 3 (RD)
Advanced topics in specifying, designing, modeling, developing, deploying, testing and maintaining software written as web applications and web services. May be repeated with change in topic.

Prerequisite(s): SWE 642 Software Engineering for the World Wide Web.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
SWE 860 - Software Analysis and Design of Real-Time Systems

Credits: 3 (NR)
Background for students who want to conduct research in software engineering of real-time systems. Provides understanding of key real-time software system analysis, design concepts and methods, and how they are used in developing large-scale, real-time software systems. Also explores potential impact of emerging technologies. Includes term project in design and analysis of complex, real-time software system.

Prerequisite(s): SWE 623

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

Spanish (SPAN)

Offered by the College of Humanities and Social Sciences

See also FRLN course listings.

SPAN 101 - Elementary Spanish I

Credits: 3 (NR)
For students with no knowledge of Spanish. Introduction to Spanish, including elements of grammar, vocabulary, oral skills, listening comprehension, and reading. Lab work required.

Notes: Students may not receive credit for SPAN 101 and SPAN 105, 109, or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

SPAN 102 - Elementary Spanish II

Credits: 3 (NR)
Continuation of SPAN 101.

Prerequisite(s): SPAN 101, appropriate placement score, or permission of department.

Notes: Students may not receive credit for SPAN 102 and SPAN 105, 109, or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

SPAN 109 - Intensive Elementary Spanish
Credits: 6 (NR)
Recommended for students who desire an intensive introduction to Spanish.

Prerequisite(s): Equivalent to SPAN 101 and 102 taught in a single semester.

Notes: Students may not receive credit for SPAN 109 and SPAN 101, 102, 105, or 110.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

SPAN 110 - Elementary Spanish

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Notes: Students may not receive credit for SPAN 110 and SPAN 101, 102, 105, 109 or 115.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 1

SPAN 115 - Review of Elementary Spanish

Credits: 3 (NR)
Reviews elements for students who have studied Spanish previously.

Prerequisite(s): Appropriate placement score or permission of the department.

Notes: Students may not receive credit for SPAN 115 and also SPAN 101, 102, 105,109 or 110.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1

SPAN 201 - Intermediate Spanish I

Credits: 3 (NR)
Further development of skills in listening, speaking, reading, and writing. SPAN 201 and 202 must be taken in sequence. Lab work required.

Prerequisite(s): SPAN 102, 109, 110, appropriate placement score, or permission of department.

Notes: Students may not receive credit for SPAN 201 and SPAN 209 or 210.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 1
SPAN 202 - Intermediate Spanish II

Credits: 3 (NR)  
Application of skills to reading, composition, and discussion. Lab work required.

Prerequisite(s): SPAN 201, appropriate placement score, or permission of department.

Notes: Students may not receive credit for SPAN 202 and SPAN 209 or 210.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 1

SPAN 209 - Intensive Intermediate Spanish

Credits: 6 (NR)  
Equivalent to SPAN 201 and 202 taught in a single semester.

Prerequisite(s): SPAN 102, 105, 109, appropriate placement score, or permission of department.

Notes: Lab work required. Students may not receive credit for SPAN 209 and SPAN 201, 202, or 210.

Hours of Lecture or Seminar per week: 6  
Hours of Lab or Studio per week: 2

SPAN 210 - Intermediate Spanish

Credits: 3 (NR)  
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Spanish-speaking regions.

Prerequisite(s): SPAN 102, 110, 115 appropriate placement score, or permission of department.

Notes: Lab work required. Students may not receive credit for SPAN 210 and SPAN 201, 202, or 209.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 1

SPAN 250 - Gateway to Advanced Spanish

Credits: 3 (NR)  
Integration of advanced intermediate-level Spanish reading, writing, listening, and speaking skills, as well as the development of critical thinking about authentic texts from around the globe.
Prerequisite(s): SPAN 210, appropriate placement score, or permission of department.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 301 - Grammar and Syntax

Credits: 3 (NR)
In-depth review of Spanish grammar and syntax. Extensive practice in controlled and free writing with emphasis on fundamental difficulties and points of interference that exist between English and Spanish.

Prerequisite(s): SPAN 202, 209, appropriate placement score, or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 305 - Spanish in Context I

Credits: 3 (NR)
Integrated content-based approach to the study of Spanish, designed to promote oral and written abilities, as well as critical understanding of Latin American, Latino, and/or Spanish histories and cultures. Includes vocabulary-building activities, grammar review and practice, assigned readings in a variety of genres, critical cultural analysis, in-class discussions, written essays, and the viewing of films.

Prerequisite(s): SPAN 250 or equivalent, or permission of instructor.

Notes: Taught in Spanish. Students cannot receive credit for SPAN 305 if they receive credit for SPAN 309 or 315.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 306 - Spanish in Context II

Credits: 3 (NR)
Continuation of SPAN 305.

Prerequisite(s): SPAN 305 or equivalent, or permission of instructor.

Notes: Taught in Spanish. Students cannot receive credit for SPAN 306 if they received credit for SPAN 309 or 315.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SPAN 309 - Intensive Spanish in Context

Credits: 6 (NR)
Intensive content-based approach to the study of Spanish, designed to promote oral and written abilities, as well as critical understanding of Latin American, Latino, and/or Spanish histories and cultures. Includes vocabulary-building activities, grammar review and practice, assigned readings in a variety of genres, critical cultural analysis, in-class discussions, written essays, and the viewing of films.

Prerequisite(s): SPAN 250 or equivalent, or permission of instructor.

Notes: Taught in Spanish. Students cannot receive credit for both SPAN 309 and SPAN 305, 306, or 315.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

SPAN 315 - Spanish for Heritage Speakers

Credits: 3 (NR)
Designed for students who have some communicative ability in Spanish, normally acquired in the home, who want to improve their reading and writing abilities while developing a critical understanding of Latin American, Latino, and/or Spanish histories and cultures. Course components include orthography and vocabulary activities, grammar review and practice, assigned readings in a variety of genres, critical cultural analysis, in-class discussions, written essays, and the viewing of films.

Prerequisite(s): Appropriate placement score or permission of instructor.

Notes: Students cannot receive credit for both SPAN 315 and SPAN 305, 306, or 309.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 321 - Introduction to Spanish Culture

Credits: 3 (NR)
History, culture, economic and social development, and scientific and artistic achievements that have contributed to the formation of modern Spain.

Equivalent to SPAN 461

Prerequisite(s): ENGH 101 or equivalent, or permission of instructor.

Notes: Taught in English. Designed for students who are not pursuing a concentration in Spanish. Students may not receive credit for both SPAN 321 and 461.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SPAN 322 - Introduction to Latin American Culture

Credits: 3 (NR)
History, culture, economic and social development, and scientific and artistic achievements that have contributed to the formation of modern Latin America.

Fulfills general education requirement in global understanding.

Equivalent to SPAN 466

Prerequisite(s): ENGL 101/ENGH 101 or equivalent, or permission of instructor.

Notes: Taught in English. Designed for students who are not pursuing a concentration in Spanish. Students may not receive credit for both SPAN 322 and 466.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 323 - Field Study in Hispanic Culture

Credits: 1-3 (NR)
History, culture, economic and social development, and scientific and artistic achievements that have contributed to the formation of modern Spain.

Prerequisite(s): 60 credits or permission of instructor.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

SPAN 324 - Study Abroad in Spanish

Credits: 3 (NR)
Study at an academic institution in a Spanish-speaking country including classroom studies with professors from the host country and field experiences.

Prerequisite(s): SPAN 250 (or equivalent) or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 325 - Major Hispanic Writers

Credits: 3 (RT)
Study of the works of major Hispanic writers in translation. Writers studied vary.

Fulfills general education requirement in literature.
Prerequisite(s): ENGH 101 or equivalent.

Notes: Taught in English. Designed for students who are not pursuing a concentration in Spanish. May be repeated once for credit when topic is different with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPAN 326 - Treasures of Spanish American Literature**

Credits: 3 (RD)
Introduction to the major themes, trends, and cultural context of Latin American literature. Writers studied vary.

Prerequisite(s): Advanced oral and written proficiency in Spanish, to be determined by the instructor.

Notes: Taught in Spanish. Designed for students who are not pursuing a concentration in Spanish. May be repeated for a maximum of 6 credits when topic is different with permission of the department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPAN 329 - Special Topics in Spanish and Latin American Literature**

Credits: 3 (RT)
Study of selected topics in Spanish or Latin American literature. Writers and topics vary.

Prerequisite(s): ENGL 101/ENGH 101, or permission of instructor.

Notes: Taught in English. Designed for students who are not pursuing a concentration in Spanish. May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPAN 335 - Topics for Proficiency: The Americas**

Credits: 3 (RD)
Integrated content-based approach to conversational Spanish. Designed to promote increased confidence and fluency in both formal and informal Spanish registers, as well as critical understanding of Latin American and/or Latino histories and cultures. Current events, films, literary texts, and popular culture reflecting issues of Latin Americans and/or Latinos serve as catalysts for class discussions, oral presentations, and debates.

Prerequisite(s): SPAN 250 (or equivalent) or permission of instructor.

Notes: Taught in Spanish. May be repeated for a maximum of 6 credits when topic is different.
SPAN 336 - Topics for Proficiency: Spain

Credits: 3 (RD)
Integrated content-based approach to conversational Spanish. Designed to promote increased confidence and fluency in both formal and informal Spanish registers, as well as critical understanding of Spanish history and culture. Current events, films, literary texts and popular culture reflecting Spanish issues serve as catalysts for class discussions, oral presentations and debates.

Prerequisite(s): SPAN 250 (or equivalent) or permission of instructor.

Notes: Taught in Spanish. May be repeated for a maximum of 6 credits when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 351 - Oral Spanish

Credits: 3 (NR)
Development of oral expression on topics of current interest and everyday situations, including written assignments.

Prerequisite(s): SPAN 250 or equivalent; appropriate placement score; or permission of instructor.

Notes: Taught in Spanish. Not open to native speakers of Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 370 - Spanish Writing and Stylistics

Credits: 3 (NR)
Improves writing skills by covering formal and stylistic concepts of the Spanish language. Includes practice and exposure to different textual genres in an interdisciplinary fashion. Includes common doubts concerning spelling, expression, and style; business Spanish; journalistic Spanish; academic Spanish; and creative writing.

Fulfills writing intensive requirement in the major.

Equivalent to SPAN 452

Prerequisite(s): SPAN 306 or 309, or 315, or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SPAN 385 - Introduction to Spanish Linguistics

Credits: 3 (NR)
Introduces the study of Spanish linguistics, including phonetics, phonology, morphology, syntax, pragmatics, historical linguistics, and sociolinguistics. Combines discussion of theoretical issues with linguistic analysis of Spanish.

Prerequisite(s): SPAN 370 or permission of instructor.

Corequisite(s): SPAN 370 or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 388 - Introduction to Latina/o Studies

Credits: 3 (NR)
Interdisciplinary approach to the study of U.S. Latina/o cultural production, designed to promote critical thinking in understanding Latina/o histories, literatures, and cultures.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all other required general education courses. SPAN 370 or permission of instructor.

Corequisite(s): SPAN 370 or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 390 - Introduction to Hispanic Literary Analysis

Credits: 3 (NR)
Required course that prepares students for the study of Hispanic literatures. Introduces basic terminology of literary analysis and provides practice in the examination of texts in the major genres: poetry, narrative, and drama.

Prerequisite(s): SPAN 370 or permission of instructor.

Corequisite(s): SPAN 370 or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SPAN 400 - Spanish for the Professions

Credits: 3 (NR)
Advanced study of the language needed for use in a specific profession, such as translation, business, social service, or health professions.

Prerequisite(s): SPAN 385 or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 425 - Independent Study

Credits: 1-3 (RT)
Research and analysis of a selected problem in literature or linguistics in consultation with a department member.

Prerequisite(s): Spanish major with 90 credits, and permission of instructor.

Notes: Maximum of 6 credits of independent study may be applied to fulfillment of requirements for the major.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

SPAN 426 - Independent Study

Credits: 1-3 (RT)
Research and analysis of a selected problem in literature or linguistics in consultation with a department member.

Prerequisite(s): Spanish major with 90 credits, and permission of instructor.

Notes: Maximum of 6 credits of independent study may be applied to fulfillment of requirements for the major.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 430 - Spanish in the United States

Credits: 3 (NR)
Covers both formal and sociolinguistic aspects of Spanish in the U.S. by discussing demographic aspects and a historical overview of the varieties of Spanish spoken in the United States. Gives a foundation in issues such as linguistic variation, language choice, the relationship among race, ethnicity, and language; official language policies; individual and societal bilingualism; and language diversity in education.
Prerequisite(s): SPAN 385, or advanced ability in Spanish or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPAN 452 - Advanced Written Spanish**

Credits: 3 (NR)

Development of skills required in writing Spanish. Guided and original compositions. Grammatical structures reviewed and supplemented with individual corrections.

Equivalent to SPAN 370

Prerequisite(s): 9 credits of SPAN at 300 level or above, or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPAN 455 - Spanish-English Translation**

Credits: 3 (NR)

Introduction to the history, theory, analysis, and practice of Spanish-English and English-Spanish translation. Includes literal versus free translation; denotation and connotation; regional and social variation; intercultural pragmatic differences; interlanguage influence and calques; and genre and audience. Hands-on experience with literary works, newspaper articles, and advertisements, as well as legal, medical, and technical documents.

Prerequisite(s): SPAN 370 and ENGL 302/ENGH 302; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPAN 461 - Spanish Civilization and Culture**

Credits: 3 (NR)

Survey of Spanish culture and civilization from the pre-Roman era to the 20th century.

Equivalent to SPAN 321

Prerequisite(s): SPAN 370 or permission of instructor.
Notes: Taught in Spanish. Students may not receive credit for both SPAN 321 and 461.

**SPAN 466 - Latin American Civilization and Culture**

Credits: 3 (NR)
Introduction to the study of Latin American civilization and culture from the pre-Columbian era to the 20th century.

Equivalent to SPAN 322

Prerequisite(s): SPAN 370 or permission of instructor.

Notes: Taught in Spanish. Students may not receive credit for both SPAN 322 and 466.

**SPAN 472 - Spanish Phonetics and Phonology**

Credits: 3 (NR)
Introduction to the analysis of the Spanish sound system, both phonetics and phonology. Topics include the articulatory system, sound production, the classification of vowels and consonants, phonetic transcription, the mental representation of sounds, variation and accent, and processes of sound change, among others.

Prerequisite(s): SPAN 385 or permission of instructor.

**SPAN 474 - Spanish Syntax and Semantics**

Credits: 3 (NR)
Investigates the knowledge Spanish speakers possess that enables them to understand and create expressions they have not heard before. Studies the system unconsciously used by Spanish speakers and writers to connect situations in the real world to the words and sentences that express each situation. Provides opportunities to analyze samples of language in actual use.

Prerequisite(s): SPAN 385 or permission of instructor.

**SPAN 476 - Teaching Spanish in the United States**
Credits: 3 (NR)
Introduction to second language acquisition theory and research, and the application to teaching Spanish as a second language and a heritage language. Includes a discussion of sociocultural and political issues surrounding the teaching of Spanish in the United States. Covers learning objectives, critical pedagogy, course design, grammar instruction, task-based language teaching, computer-assisted language learning, materials evaluation, and assessment.

Prerequisite(s): SPAN 385 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 480 - Special Topics in Spanish

Credits: 3 (RT)
Study of a selected theme in Hispanic literature, culture, or linguistics.

Prerequisite(s): SPAN 385, 388 or 390, depending on topic, or permission of instructor.

Notes: Taught in Spanish. May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 481 - Special Topics in Spanish

Credits: 3 (RT)
Study of a selected theme in Hispanic literature, culture, or linguistics.

Prerequisite(s): SPAN 385, 388 or 390, depending on topic, or permission of instructor.

Notes: Taught in Spanish. May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 483 - The Literature of Spain I

Credits: 3 (NR)
Examines the main periods, trends, genres, and most representative works of the Spanish peninsular literature from its beginnings to the end of the Golden Age.

Prerequisite(s): SPAN 390 or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SPAN 484 - The Literature of Spain II

Credits: 3 (NR)
Examines the main periods, trends, genres, and most representative works of Spanish peninsular literature from the 18th century to the contemporary period.

Prerequisite(s): SPAN 390, 483, or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 486 - Topics in Latin American Literature

Credits: 3 (NR)
An interdisciplinary examination and discussion of major topics in literary texts and cultural practices of Latin America from pre-colonial times to the mid-19th century.

Prerequisite(s): SPAN 390 or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 487 - Topics in Latin American Literature II: Late 19th Century to the Present

Credits: 3 (NR)
Interdisciplinary examination and discussion of major topics in literary texts and cultural practices of Latin America from the late 19th century to the present.

Prerequisite(s): SPAN 390 or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 488 - The Literature of Spanish America

Credits: 3 (NR)
Survey of the literature of Spanish America. Study of texts that are representative of the colonial, romantic, modernista, avant garde, and contemporary periods.
Prerequisite(s): SPAN 390 or permission of instructor.

Notes: Taught in Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 490 - Internship in Spanish

Credits: 1-6 (NR)
Qualified students work with area schools, social service programs, government agencies, interest groups, museums, or corporations. Specific arrangements must be made with, and approved by, a member of the Spanish faculty during the semester prior to enrollment.

Prerequisite(s): 9 credits in Spanish at the 300 level, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 497 - Senior Honors Tutorial

Credits: 3 (NR)
First semester involves weekly meetings with a faculty member to discuss readings from a comprehensive list prepared by the Spanish faculty. In the second semester, independent research and completion of an honors essay under the supervision of a member of the Spanish faculty are required.

Prerequisite(s): Spanish major with 90 credits, cumulative GPA of 3.00, and GPA of 3.00 in major field.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 498 - Senior Honors Tutorial

Credits: 3 (NR)
Students meeting these requirements are admitted to candidacy on submission of a letter of application to the department Honors Committee in the second half of the junior year. A faculty recommendation and an interview by the Honors Committee are also required. First semester involves weekly meetings with a faculty member to discuss readings from a comprehensive list prepared by the Spanish faculty. In the second semester, independent research and completion of an honors essay under the supervision of a member of the Spanish faculty are required.

Prerequisite(s): Spanish major with 90 credits, cumulative GPA of 3.00, and GPA of 3.00 in major field.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SPAN 500 - History of the Spanish Language

Credits: 3 (NR)
Scientific study of the evolution of the Spanish language from its origin in Vulgar Latin to its present forms.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 501 - Applied Spanish Grammar

Credits: 3 (NR)
Analysis of Spanish grammar as a basis for teaching language skills. Terminology and methodology for the teaching of syntax are stressed.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 502 - Hispanic Sociolinguistics

Credits: 3 (NR)
Introduction to sociolinguistics with emphasis on bilingualism and language contact in the Spanish-speaking world including the United States.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 505 - Applied Spanish Stylistics

Credits: 3 (NR)
Advanced study of the written language for students who want to develop their academic writing skills. Covers the most frequent challenges of writing through intensive practice in genres such as argumentation, narration, and description. Teaches students to identify and analyze best practices in academic writing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 510 - Introduction to the Graduate Study of Literature in Spanish

Credits: 3 (NR)
Study of the nature of literary work and analysis of critical approaches to literature with an emphasis on texts written in Spanish. Course is a requirement for master's students of Spanish in their first year of study.

Prerequisite(s): Graduate standing in master's program in foreign languages, or permission of instructor.
SPAN 520 - Studies in Medieval Spanish Literature

Credits: 3 (NR)
Study of a major work or a literary genre of this period.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 525 - Studies in Renaissance Literature

Credits: 3 (NR)
Study of a literary movement or selected authors of the Spanish Renaissance.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 530 - Studies in the Literature of the Golden Age

Credits: 3 (NR)
Study of a literary genre or a major author of Spanish literature of the Golden Age.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 540 - Studies in 20th-Century Literature

Credits: 3 (NR)
Study of a writer, genre, theme, or movement of this period.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 545 - Studies in Hispanic Literature

Credits: 3 (NR)
Study of major writers in a particular generation or movement.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
SPAN 551 - Special Topics in Spanish

Credits: 3 (RT)
Special studies in Spanish or Latin American language, literature, or culture. Specific topics are announced in advance.

Notes: May be repeated for credit with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 560 - Studies in Spanish American Poetry

Credits: 3 (NR)
Study of major poets of a given period. Literary and social atmosphere of the period are emphasized.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 565 - Studies in Spanish American Drama

Credits: 3 (NR)
Study of playwrights who have made a major contribution to the development of the genre.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 576 - Advanced Translation

Credits: 3 (NR)
Advanced work in translation of selected texts from diverse fields. Comparative terminology, sight translation, and précis writing. Emphasis on the function and technique of documentation in translation. Translation from Spanish to English and from English to Spanish.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 580 - Contemporary Hispanic Institutions

Credits: 3 (NR)
Study of 20th-century cultural, social, and political institutions in Spain and Spanish America with emphasis on language and terminology used to describe their functions, regulations, and conditions.
**SPAN 635 - Seminar in Don Quixote**

Credits: 3 (NR)
Study of Don Quixote and major critical approaches to the work.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SPAN 650 - Seminar in Twentieth-Century Drama**

Credits: 3 (NR)
Study of major dramatists in the generation of 1898 and contemporary theater.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SPAN 655 - Seminar in Twentieth-Century Prose**

Credits: 3 (NR)
Study of major writer, theme, or movement in novel or essay.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SPAN 670 - Seminar in Spanish American Prose**

Credits: 3 (NR)
Study of a selected theme, movement, or author in the novel, short story, or essay.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SPAN 675 - Seminar in Literature and Art**

Credits: 3 (NR)
Comparative analysis of a literary theme or style in relation to other media (painting, architecture, film) for an integral understanding of the arts.
SPAN 680 - Seminar in Literature and Society

Credits: 3 (NR)
Study of a literary topic, a genre, or selected authors in relation to a given economic, social, or political system in Spain or Latin America.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 685 - Seminar in Literature and Ideas

Credits: 3 (NR)
Study of major ideological-philosophical themes and their artistic expression in literature.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPAN 798 - Directed Reading and Research

Credits: 3 (NR)
Open only to degree students who have completed at least 18 credits. Reading and research on a specific project under the direction of a department member. Oral or written report required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

SPAN 799 - Thesis

Credits: 1-6 (RD)
Students who take SPAN 798 and then elect thesis option receive 3 credits for SPAN 799 on completion of thesis. Students who do not take SPAN 798 receive 6 credits for SPAN 799 on completion of the thesis.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: S/NC

SPAN 800 - Studies for the Doctor of Philosophy in Education
Credits: 3-6 (RD)
Studies designed by student's discipline director and approved by student's doctoral committee that prepare student for research and writing in area of interest in discipline.

Prerequisite(s): Admission to PhD in education program to study in Spanish.

Notes: Enrollment may be repeated.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

Special Education (EDSE)

Offered by the College of Education and Human Development

EDSE 401 - Introduction to Special Education

Credits: 3 (NR)
Provides a survey of current knowledge on individuals with disabilities within the context of human growth and development across the life span. Content includes historical factors, legislation, etiology, characteristics, needs, educational strategies, assessment, and support services of and for individuals with disabilities ranging from mild and moderate to severe levels of varying disabilities. Includes the impact of disabilities on academic, social, and emotional performances. Field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 402 - Classroom Management and Applied Behavior Analysis

Credits: 3 (NR)
Focuses on identifying, recording, evaluating, and changing social and academic behaviors of special and diverse populations. Explores theories of classroom management and various approaches to management, including use of technological advances. Emphasizes developing classroom and individual behavior management plans.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 403 - Language Development and Reading

Credits: 3 (NR)
Identifies literacy skills for typical students, and describes reading, language, and writing instruction for students with mild disabilities who access the general curriculum. Topics include emergent literacy skills, phonemic awareness, vocabulary development, and comprehension.
Prerequisite(s): EDSE 401 and EDSE 440.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 405 - Introduction to Early Childhood Special Education

Credits: 3 (NR)
Surveys current knowledge about young children with disabilities within the context of human growth and development and learning expectations in the preschool years. Includes factors and legislation affecting service delivery. Field experience required.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 411 - Characteristics of Students with Visual Impairments

Credits: 1 (NR)
Provides an overview of the characteristics of and services to persons with visual impairments, including the impact of visual impairment on infants' and children's growth and development, child and adolescent emotional and social development, and family interaction patterns. Considers the educational, conceptual, psychosocial, and physical implications of a visual impairment.

Notes: Course delivered online.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDSE 412 - Braille Code

Credits: 3 (NR)
Provides understanding of the literary code of Braille and its implications for educational/literacy programs for students with a visual disability. Practice experiences will enable students to better understand the Braille code and how to teach it to students with a visual disability.

Prerequisite(s): EDSE 411.

Corequisite(s): EDSE 411.

Notes: Delivered online.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 414 - Orientation and Mobility
EDSE 415 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches

Credits: 3 (NR)
Explores current public policy initiatives for coordinating services for infants and toddlers. Covers models of services delivery and approaches to family-centered service.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 418 - Curriculum and Assessment of Students with Visual Impairments

Credits: 3 (NR)
Provides students with knowledge and understanding of the educational assessment of students with visual impairments and additional disabilities including deaf-blindness. Students practice assessing and planning educational programs for students with visual impairments. Addresses assessment of technology for students with visual impairments. Examines determination of learning needs and appropriate learning media, relationship of assessment, IEP development, and placement. Delivered online.

Prerequisite(s): EDSE 411

Notes: Delivered online.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 422 - Augmentative Communication

Credits: 2 (NR)
Focuses on alternative language, literacy, and communication techniques for children with severe language and speech
impairments.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

**EDSE 428 - Elementary Reading, Curriculum, and Strategies for Students Who Access the General Education Curriculum**

Credits: 3 (NR)  
Applies research on instructional approaches in elementary curriculum for individuals with disabilities accessing general education curriculums. Includes curriculum and instructional strategies in reading, language arts, mathematics, science, social studies, and social skills; cognitive strategies in study skills, attention and memory, and peer-mediated instruction.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDSE 429 - Secondary Curriculum and Strategies for Mild Disabilities**

Credits: 3 (NR)  
Applies research on teacher effectiveness, teacher accountability, instructional approaches, and technological advances at the secondary level for individuals with emotional disturbance, learning disabilities, and mental retardation. Includes curriculum and instructional strategies in reading, language arts, math, science, social studies, and social skills; cognitive strategies in self-regulation, study skills, attention, memory, and motivation; peer-mediated instruction including cooperative learning and peer tutoring; and self-advocacy and strategies for facilitating transition to community, workplace, and post-secondary environments.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDSE 431 - Transition and Community-Based Instruction**

Credits: 3 (NR)  
Addresses issues in transition for youth with severe disabilities. Covers self-determination, development and implementation of a transition plan, post-secondary opportunities including education and community-based instruction, and vocational environments.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**EDSE 432 - Positive Behavior Supports**

Credits: 3 (NR)  
Focuses on employing concepts and skills to design, implement, and evaluate behavior support programs derived from functional assessment; using effective teaching strategies; addressing relevant replacement skills; facilitating generalization and maintenance of skills and incorporating individually designed crisis intervention procedures.
**EDSE 434 - Communication and Severe Disabilities**

Credits: 3 (NR)
Introduces professionals to augmentative and alternative communication (AAC) for individuals with severe speech and language impairments. Addresses knowledge and skills needed to assess the potential AAC user, make team decisions, develop and implement instruction, and evaluate the effects of instruction aimed at motivating, building, and expanding communication, choice-making, and social interaction.

**EDSE 440 - Characteristics of Students with Disabilities Who Access the General Curriculum**

Credits: 3 (NR)
Covers theories and specific conditions in learning disabilities and emotional disorders. Includes the impact of these learning and behavioral differences on academic and social and emotional performances. Addresses diversity within student populations. Experiential, observational, and interactive strategies, including use of technological advances, are used to facilitate fulfillment of the outcomes established for the course.

**Notes:** May require field experience.

**EDSE 442 - Characteristics of Students with Mental Retardation**

Credits: 3 (NR)
Covers theories and specific conditions in mental retardation, and provides advanced study of persons with mental retardation, ranging in age from preschool to adult. Topics include historical development of the field of mental retardation; theoretical models of mental retardation; etiological factors; characteristics; models of assessment and intervention, including technological advances; and issues and trends, including legislation and litigation. Includes the study of the impact of mental retardation on academic and social and emotional performances. Field experience required.

**EDSE 447 - Medical and Developmental Risk Factors for Children with Disabilities**

Credits: 3 (NR)
Examines nature and causes of disabling or special health conditions. Examines screening and evaluation techniques,
EDSE 456 - Language Development and Communication for Diverse Infants and Toddlers

Credits: 3 (NR)
Provides understanding of early language development in terms of each of the five major components of language. Speech, language, and communication are discussed, particularly in terms of their interrelatedness with cognitive and sociocultural development. Explores importance of adult-child interaction, and impact of bilingualism, cultural diversity, cognitive ability, and language disorder.

EDSE 457 - Foundations of Language and Literacy for Diverse Learners

Credits: 3 (NR)
Addresses first and second language acquisition and its application in the various contexts in which children develop. Explores the impact of disability and second language acquisition, and the inter-relationship of speaking, listening, and writing. Includes review of characteristics and etiology of children with language disabilities. Also addresses the diversity of communication styles in families, communities, and cultures. Field experience required.

EDSE 458 - Medical Aspects of Physical and Sensory Disabilities in Young Children

Credits: 3 (NR)
Focuses on physical, sensory, medical, and health aspects of child development, including etiology and symptomatology of developmental disabilities affecting physical development. Emphasizes positioning, handling, adaptive strategies, and understanding of assistive technology devices. Focuses on the understanding of roles of related disciplines in collaborative planning and service delivery. Field experience required.

EDSE 459 - Curriculum and Methods: Early Childhood Special Education

Credits: 3 (NR)
Emphasizes planning, organizing, implementing, and evaluating programs for young children with special needs.
EDSE 460 - Introduction to Applied Behavior Analysis

Credits: 3 (NR)
Students will master basic principles, procedures, and ethical concepts pertaining to applying behavior analysis in schools or in other educational or therapeutic settings developed to satisfy part of the educational requirements needed for sitting for the Board Certified Assistant Behavior Analyst examination.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

EDSE 461 - Analysis and Intervention in Applied Behavior Analysis

Credits: 3 (NR)
Teaches students basic data collection, presentation, and analysis as it pertains to applied behavior analysis; as well as procedures for determining intervention efficacy and selecting, developing, or modifying interventions based on data, in educational and other settings to satisfy part of the educational requirement to sit for the Board Certified Assistant Behavior Analyst (BCABA) examination.

Prerequisite(s): EDSE 460, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

EDSE 462 - Applying Behavior Analysis in School and Community Settings

Credits: 3 (NR)
Teaches a variety of procedural topics in applied behavior analysis pertaining to developing effective instruction and interventions for a variety of content areas, skills, and adaptive and problem behaviors. Additionally, provides instruction on gaining collaboration of those around the student in assuring the student's success, and ethical concerns in meaningfully applying behavior analysis. Course is developed to satisfy part of the educational requirement to sit for the Board Certified Assistant Behavior Analyst (BCABA) examination.

Corequisite(s): EDSE 460 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

EDSE 490 - Internship in Applied Behavior Analysis
Provides hands-on experience implementing, evaluating, and participating in development and revision of behavior analytically based instruction and related procedures with children who are diagnosed with intellectual disabilities or behavioral difficulties, under supervision of a Board Certified Behavior Analyst. Individual and group, and on-site and off-site supervision modalities are used. Additional professional development instruction is provided. Satisfies part of the experiential requirements needed for sitting for the Board Certified Assistant Behavior Analyst examination.

**Prerequisite(s):** Admission to or prior completion of the undergraduate Applied Behavior Analysis minor, completion of an undergraduate course of study that has been approved by the Behavior Analyst Certification Board, or consent of the instructor.

**Corequisite(s):** EDSE 460, EDSE 461, EDSE 462, or permission of instructor.

**Hours of Lecture or Seminar per week:** 2-4  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit only  
**When Offered:** Fall, Spring, Summer

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**EDSE 500 - In-Service Educational Development**

Credits: 1-6 (NR)  
Offered at request of school division or other educational agency.

**Notes:** Content varies; may be repeated for credit.

**Hours of Lecture or Seminar per week:** 1-6  
**Hours of Lab or Studio per week:** 0

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**EDSE 501 - Introduction to Special Education**

Credits: 3 (NR)  
Survey of current knowledge on individuals with disabilities within the context of human growth and development across the life span. Includes historical factors, legislation, etiology, characteristics, needs, educational strategies, assessment, and support services for individuals with disabilities ranging from mild and moderate to severe. Includes the impact of disabilities on academic, social, and emotional performances. Field experience required.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EDSE 502 - Classroom Management and Applied Behavior Analysis**

Credits: 3 (NR)  
Explores how to identify, record, evaluate, and change social and academic behaviors of special and diverse populations. Explores theories of classroom management and various approaches to management including use of technological advances. Emphasizes developing classroom and individual behavior-management plans.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
EDSE 503 - Language Development and Reading

Credits: 3 (NR)
In-depth coverage of reading instruction for students with special needs. Topics include language development and emergent literacy skills; reading subskills including auditory discrimination and phonemic awareness, decoding and word reading; reading comprehension; and use of technological advances in the teaching of reading.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 504 - Elementary Curriculum and Content for Special Educators

Credits: 2 (NR)
Reviews elementary curriculum content and instructional approaches for the instruction of individuals with disabilities in language arts/reading, mathematics, science, and social studies. Addresses core knowledge for Elementary Praxis II.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EDSE 505 - Introduction to Early Childhood Special Education

Credits: 3 (NR)
Surveys current knowledge about young children with disabilities within the context of human growth and development and learning expectations in the preschool years. Includes historical factors and legislation affecting service delivery.

Notes: Field experience required

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 510 - Introduction to Assistive Technology

Credits: 3 (NR)
Provides an understanding of assistive technology and application in instructional programs, career tasks, and life skills for persons with disabilities. Presentation and demonstration experiences enable students to better use assistive technology in education, work, community, and home environments. Knowledge and awareness components may be delivered via distance education.

Equivalent to EDIT 510

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDSE 511 - Characteristics of Students with Visual Impairments

Credits: 1 (NR)
Provides an overview of the characteristics of and services to persons with visual impairments, including the impact of visual impairment on infants’ and children's growth and development, child and adolescent emotional and social development, and family interaction patterns. Considers the educational, conceptual, psychosocial, and physical implications of a visual impairment.

Notes: Course delivered online.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDSE 512 - Braille Code

Credits: 3 (NR)
Provides understanding of the literary code of Braille and its implications for educational/literacy programs for students with a visual disability. Practice experiences enable students to better understand the Braille code and how to teach it to students with a visual disability.

Prerequisite(s): EDSE 511 (may be taken concurrently).

Notes: Delivered online.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 513 - Medical and Educational Implications of Visual Impairments

Credits: 3 (NR)
Provides an introduction to anatomy and physiology of the visual system and the educational implications of visual pathology. Topics include anatomy of the human eye, normal visual development, pathology of the eye, examination procedures for the identification of visual pathology, and the effects of pathology on visual learning and development.

Prerequisite(s): EDSE 511 (may be taken concurrently).

Notes: Delivered online.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 514 - Orientation and Mobility for Students with Visual Impairments

Credits: 2 (NR)
Provides the foundation for understanding the components and essence of orientation and mobility (O&M). Establishes how the need for independent travel in the blind population created the field of O&M. Explores the philosophy and history of orientation
and mobility, including cane instruction, dog guides, and methods of travel. Addresses techniques in developing orientation skills and basic mobility instruction. Motor and concept skill development are emphasized.

**Prerequisite(s):** EDSE 511 (may be taken concurrently).

**Notes:** Delivered online.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0

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**EDSE 517 - Computer Applications for Special Populations**

Credits: 3 (NR)  
Lecture and laboratory course for teachers of special populations in applications of computer technology for instructional programs and computer skills. Students learn to use computer technology designed for special populations.

**Prerequisite(s):** Graduate standing, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EDSE 518 - Curriculum and Assessment of Students with Visual Impairments**

Credits: 3 (NR)  
Provides students with knowledge and understanding of the educational assessment of students with visual impairments and additional disabilities including deaf-blindness. Students practice assessing and planning educational programs for students with visual impairments. Addresses assessment of technology for students with visual impairments. Examines determination of learning needs and appropriate learning media, relationship of assessment, IEP development, and placement.

**Prerequisite(s):** EDSE 511 (may be taken concurrently).

**Notes:** Delivered online.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**EDSE 522 - Assistive Technology for Individuals with Sensory Impairments**

Credits: 2-3 (NR)  
Focuses on professionals or students interested in serving visually impaired/blind or hearing-impaired/deaf populations. Heightens awareness of participants to specific technology and resources available to enhance and improve ability of individuals with disabilities.

Equivalent to EDIT 522

**Hours of Lecture or Seminar per week:** 2-3  
**Hours of Lab or Studio per week:** 0
EDSE 523 - Accessibility/Input Modification

Credits: 1-3 (NR)
Provides overview of accessibility/input modifications and strategies. Students explore various input devices and their application and use by individuals with disabilities.

Equivalent to EDIT 523

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

EDSE 524 - Assistive Technology for Individuals with Learning Disabilities

Credits: 2 (NR)
Focuses on strategies and techniques for implementing software and other technologies in lives of individuals age three to adult with learning disabilities. Students develop and implement plans for assistive technology. Requires practicum.

Equivalent to EDIT 524

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EDSE 525 - Software for Individuals with Special Needs

Credits: 1-2 (NR)
Focuses on software evaluation and design for individuals with disabilities. Explores existing software resources, and identifies design features to meet individual's special needs. Students create software program for person with disabilities (credit 2). Knowledge and awareness components may be delivered via distance education.

Equivalent to EDIT 525

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

EDSE 526 - Web Accessibility and Design

Credits: 3 (NR)
Develops understanding of principles of universal web design. Students apply understanding by designing and developing accessible web site using web-authoring tools.

Equivalent to EDIT 526

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
EDSE 527 - Adapted Sports, Recreation, and Leisure

Credits: 1 (NR)
Introduces tools for adapting sports, recreation, and leisure activities to promote the benefits of active participation, relaxation, health, and well-being for individuals with differing abilities. Students participate in simulations, research, and design. Knowledge and awareness components may be delivered via distance education.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDSE 528 - Low-Tech Assistive Technology Solutions

Credits: 1 (NR)
Focuses on functional applications of low-technology solutions within the areas of self-care; mobility and transfer communication; stability and support; sports, recreation, and leisure; and academic and work environments. Includes exploration and opportunities to design and create low-tech devices for children and adults. Knowledge and awareness components may be delivered via distance education.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

EDSE 529 - Internet as an Assistive Technology Tool

Credits: 2 (NR)
Provides overview of the web and Internet as an educational tool for students with disabilities. Focuses on presentation of strategies, accommodations, assistive technology, and Internet resources for educators. Students review and evaluate web sites, and develop an accessible Internet lesson plan or web site.

Equivalent to EDIT 529

Prerequisite(s): HTML experience.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EDSE 530 - Policy Perspectives Affecting Diverse Young Learners and Their Families

Credits: 3 (NR)
Provides understanding of historical and current trends and issues involving legislation and policy in early childhood education, bilingual education, early childhood special education, and multicultural education. Focuses on historical role of social advocacy, development of advocacy skills, and collaboration and consultation with other professionals and staff in the field of early childhood education.
EDSE 531 - Transition and Community-Based Instruction

Credits: 3 (NR)
Addresses issues in transition for youth with severe disabilities. Covers self-determination, development, and implementation of a transition plan, post-secondary opportunities including education and community-based instruction, and vocational environments.

Notes: Course is equivalent to EDSE 544 for students in the severe disabilities program.

EDSE 532 - Positive Behavior Supports

Credits: 3 (NR)
Designed for professionals working with individuals with severe disabilities. Focuses on concepts and skills needed to design, implement, and evaluate behavior support programs derived from functional assessment. Covers effective teaching strategies; addresses relevant replacement skills; facilitates generalization and maintenance of skills; and incorporates individually designed crisis intervention procedures.

Notes: Course is equivalent to EDSE 620 for students in the severe disabilities program.

EDSE 533 - Curriculum and Assessment in Severe Disabilities

Credits: 3 (NR)
Addresses best practices in curriculum and assessment for individuals with severe disabilities. Covers the design of assessment and evaluation techniques and procedures for the severe-needs population, including adaptations and accommodations. Covers IEP formulation and implementation with linkage to assessment. Course is equivalent to EDSE 649 for students in the severe disabilities program.

EDSE 534 - Communication and Severe Disabilities

Credits: 3 (NR)
Introduces professionals to augmentative and alternative communication (AAC) for individuals with severe speech and language impairments. Addresses the knowledge and skills needed to assess the potential AAC user, make team decisions, develop and implement instruction, and evaluate the effects of instruction, aimed at motivating, building, and expanding communication,
choice-making, and social interaction.

**EDSE 540 - Characteristics of Students with Disabilities who Access the General Curriculum**

Credits: 3 (NR)
Examines the characteristics of students with mild disabilities. Emphasis on etiology, contributing factors, conditions that affect learning, the challenges of identifying students with disabilities, and the need for academic, social, and emotional accommodations and support.

**Notes:** School-based field experience required.

**EDSE 542 - Characteristics of Students with Mental Retardation**

Credits: 3 (NR)
Covers theories and specific conditions in mental retardation, and provides advanced study of persons with mental retardation, ranging from preschool to adult. Topics include historical development of the field of mental retardation; theoretical models; etiological factors; characteristics; models of assessment and intervention, including technological advances; and issues and trends, including legislation and litigation. Includes the study of impact of mental retardation on academic and social and emotional performances. Requires field experience.

**EDSE 544 - Adapted Instructional Methods and Transition for Secondary Learners**

Credits: 3 (NR)
Provides strategies for teaching functional academics and social/life skills, facilitating the transition to postsecondary environments. Focuses on all aspects of transition and alternative assessments for secondary learners with disabilities.

**EDSE 547 - Medical and Developmental Risk Factors for Children with Disabilities**

Credits: 3 (NR)
Examines nature and causes of disabling or special health conditions. Covers screening and evaluation techniques, characteristics, and educational implications.
EDSE 553 - Teaching Mathematics to Students with Special Needs

Credits: 3 (NR)
Covers techniques for assessing and remediating difficulties in mathematics.

EDSE 555 - Language Development and Emerging Literacy

Credits: 3 (NR)

EDSE 556 - Developing Language, Literacy, and Communication in Young Children

Credits: 3 (NR)
Examines strategies to develop language, literacy, and communication in young children with varying abilities. Explores the importance of adult-child interaction and the effect of bilingualism, cultural diversity, cognitive ability, and language disorders.

Equivalent to ECED 522

Notes: Field Experience required

EDSE 557 - Foundations of Language and Literacy for Diverse Learners

Credits: 3 (NR)
Examines complexity of language acquisition and literacy development. Focuses on typical and atypical language development,
connections between language and literacy, and diversity of communication styles in families, and cultures. Emphasizes first and second language acquisition.

Notes: Field Experience required

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 558 - Medical Aspects of Physical and Sensory Disabilities in Young Children

Credits: 3 (NR)

Equivalent to ECED 506.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 560 - Secondary Mathematics for Special Education Teachers

Credits: 3 (NR)
Provides the necessary depth and breadth of mathematics content knowledge required for prospective secondary special education mathematics teachers. Specific content includes: Algebra and Number Theory; Geometry, Measurement and Trigonometry; Functions and Calculus; Probability, Data Analysis and Statistics; Matrix Algebra and Discrete Mathematics. Students design mathematics instruction for students with mild disabilities utilizing current evidence-based practices.

Hours of Lecture or Seminar per week: 2.5
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

EDSE 561 - Secondary Science for Special Education Teachers

Credits: 3 (NR)
Provides the necessary depth and breadth of science content knowledge required for prospective secondary special education science teachers. Prepares students for the Praxis Content Knowledge tests in five fields: Biology, Chemistry, Earth and Space Science, General Science and Physics. Design science content area instruction for students with mild disabilities utilizing current evidence-based practices.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 1
When Offered: Fall, Spring, Summer
EDSE 590 - Special Education Research

Credits: 3 (NR)
Describes fundamental concepts and practices in educational research in special education. Covers specific applications of educational research methods to problems in special education. Emphasizes review and critique of special education research, and applied classroom research for teachers.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 597 - Special Topics in Education

Credits: 1-6 (RD)
Provides advanced study on selected topic or emerging issue in Special Education.

Prerequisite(s): Admission to program in Graduate School of Education.

Corequisite(s): May be repeated for credit with GSE permission.

Notes: May be repeated for credit with GSE permission.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDSE 600 - Workshop in Education

Credits: 1-6 (NR)
Offers full-time workshops and weekend seminars on selected topics in education and education tour seminars.

Notes: May be repeated for credit.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDSE 610 - Designing Adaptive Environments

Credits: 2 (NR)
Overview of environmental adaptations for people with disabilities to increase their access to community, workplace, and school activities. Covers legal issues within the ADA for adapting environments, and addresses programmatic and physical access issues. Knowledge and awareness components may be delivered via distance education.

Prerequisite(s): EDSE/EDIT 510.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
EDSE 612 - Special Needs Students in International Schools

Credits: 3 (NR)
Focuses on students with special learning needs at international schools in the regular classroom environment. Enhances understanding of current issues within the field of special education in the international schools in an increasingly global community.

Prerequisite(s): Admission to FAST TRAIN program and EDSE 501

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 613 - Teaching Methods for Students with Visual Impairments

Credits: 3 (NR)
Emphasizes methods of teaching compensatory skills, the core curriculum, and technology for use by students who are blind and visually impaired. Addresses curriculum development, adaptations, and teaching methodology for individuals with visual impairments. Provides information on adaptations within various educational programs and adaptation of general education classroom materials and procedures for use with blind and low vision children and youth.

Prerequisite(s): EDSE 511 (may be taken concurrently).

Notes: Delivered online.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 615 - Early Intervention for Infants and Toddlers with Disabilities: Collaborative and Consultative Approaches

Credits: 3 (NR)
Covers methods of service delivery for infants and toddlers with disabilities and their families. Explores key aspects of consultation, interdisciplinary collaboration, service coordination, and family-centered services. Focuses on culturally responsive practices.

Prerequisite(s): Admission to the Early Childhood Special Education program or permission of the instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 616 - Braille Reading and Writing

Credits: 3 (NR)
Provides basic instruction on transcription of advanced Braille codes, including music, foreign language, chemistry, computer Braille, and Nemeth code (Braille math code). Introduces techniques for teaching skills in each code. Explores technology tools used to create Braille and tactile materials in addition to other assistive technologies used for instruction in math and science.
**EDSE 619 - Applied Behavior Analysis: Principles, Procedures, and Philosophy**

Credits: 3 (NR)
Focuses on basic principles and procedures of applied behavior analysis; identification of factors that contribute to behavioral problems and improved performance; and procedures that can be used to minimize behavioral problems, improve performance, teach new behaviors, and increase probability of behaviors occurring under appropriate circumstances.

Prerequisite(s): Admission to applied behavior analysis graduate certificate program.

**EDSE 620 - Managing Severely Challenging Behaviors and Applied Behavior Analysis**

Credits: 3 (NR)
Focuses on applying behavior analysis principles and social learning theory to increase learning by students with special needs. Emphasizes single subject research designs.

Prerequisite(s): Graduate standing and permission of advisor.

**EDSE 621 - Applied Behavior Analysis: Empirical Bases**

Credits: 3 (NR)
Focuses on basic content of applied behavior analysis. Teaches how to implement behavioral procedures and develop behavioral programs for clients with fundamental behavioral needs.

Prerequisite(s): EDSE 619

Corequisite(s): EDSE 619

**EDSE 622 - Augmentative Communication**
Credits: 2 (NR)
Focuses on alternative language, literacy, and communication techniques for children with severe language and speech impairments.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

EDSE 623 - Applied Behavior Analysis: Assessments and Interventions

Credits: 3 (NR)
Further expands on basic content of applied behavior analysis and teaches how to implement behavioral procedures and develop behavioral programs for clients with fundamental behavioral needs.

Prerequisite(s): EDSE 619.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 624 - Applied Behavior Analysis: Applications

Credits: 3 (NR)
Expands capability to deal with more complex behavioral situations, enabling ability to relate to more sophisticated professional issues and environments.

Prerequisite(s): EDSE 621 and 623

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 625 - Applied Behavior Analysis: Verbal Behavior

Credits: 3 (NR)
Further expands capability to deal with more complex behavioral situations, and enables students to relate to more sophisticated professional issues and environments.

Prerequisite(s): EDSE 623.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 626 - The Inclusive Classroom

Credits: 3 (NR)
Introduces participants to instructional procedures for facilitating inclusive instruction for students with disabilities in general
education settings. Topics include research-based strategies for adapting curriculum materials, designing instructional procedures, and evaluating students with disabilities.

Prerequisite(s): None

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDSE 627 - Assessment**

Credits: 3 (NR)

Offers knowledge and experiential learning activities related to assessment of students with mild disabilities. Includes statistical and psychometric concepts in assessment. Addresses norm-referenced, criterion-referenced, curriculum-based, and informal assessment for instructional and placement decisions.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDSE 628 - Elementary Reading, Curriculum, and Strategies for Students who Access the General Education Curriculum**

Credits: 3 (NR)

Applies research on instructional approaches, in elementary curriculum for individuals with disabilities accessing general education curriculums. Includes curriculum/instructional strategies in reading, language arts, mathematics, science, social studies, cognitive strategies, study skills, attention/memory, and peer-mediated instruction.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDSE 629 - Secondary Curriculum and Strategies for Students with Disabilities who Access the General Curriculum**

Credits: 3 (NR)

Applies research on teacher effectiveness, accountability, and instructional approaches at the secondary level for individuals with mild disabilities. Includes instructional methods necessary for teaching reading, writing, math, and other content areas across the curriculum.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDSE 633 - Policy Perspectives Affecting Diverse Young Learners**
Provides understanding of historical and current trends and issues involving legislation and policy in early childhood education, bilingual education, early childhood special education, and multicultural education. Focuses on historical role of social advocacy, development of advocacy skills, and collaboration and consultation with other professionals and staff. Addresses continuum of services and the context of service delivery. Requires field experience.

**Prerequisite(s):** Admission to the Graduate School of Education.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDSE 634 - Characteristics of Students with Autism

Credits: 3 (NR)  
Describes varying characteristics of students labeled with a type of autism who receive special education services. Examines definitions, eligibility criteria, incidence rates, and etiology. Perspectives from students, families, educational, community, and career personnel are described.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDSE 635 - Interventions for Students with Autism

Credits: 3 (NR)  
Research-based interventions that promote progress in the areas of communication, social, academic, behavior, and sensory motor skills for students with autism are described. Methods for monitoring the impact of interventions are identified and a variety of service delivery models are described.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDSE 648 - Introduction to Psycho-Educational Assessment

Credits: 3 (NR)  
Introduces basic statistical procedures and test characteristics. Appropriate terminology and practices related to formal and informal assessment applied throughout the course. Students practice administering, scoring, and interpreting tests, including the impact of multicultural diversity on assessment.

**Prerequisite(s):** EDSE 540.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDSE 649 - Advanced Clinical Psycho-Educational Assessment in Special Education
Credits: 3 (NR)
Focuses on advanced issues in administering, scoring, and interpreting education evaluation instruments with emphasis on writing reports and developing the Individualized Education Program. Considers using assessment results for instructional and placement decisions.

Prerequisite(s): EDSE 648 is required for ED/LD students.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 655 - Curriculum Methods: Elementary ED/LD

Credits: 3 (NR)
Applies research on teaching effectiveness, teaching accountability, and instructional approaches with specific attention to reading, language arts, social skills, and cooperative learning. May require field experience in public schools.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 656 - Assessment of Diverse Young Learners

Credits: 3 (NR)
Examines types of assessment, including family-centered assessment, used for planning and implementing effective programs for children from diverse cultures and with varied learning needs. Addresses selection, administration, and interpretation of formal and informal assessments.

Equivalent to ECED 521.

Prerequisite(s): Admission to the Early Childhood Special Education program or permission of the instructor

Notes: Field Experience required

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 659 - Curriculum and Methods: Early Childhood Special Education

Credits: 3 (NR)

Prerequisite(s): Admission to the Early Childhood Special Education program or permission of instructor.
Notes: Field Experience required

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDSE 661 - Curriculum and Methods: Severe Disabilities**

Credits: 3 (NR)
Focuses on current best practices in curriculum, and methods for students with severe disabilities, including specific strategies for teaching students with severe disabilities, general strategies for working with heterogeneous groups of students in inclusive settings, and methods for adapting the general education curriculum to include students with severe disabilities.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDSE 662 - Consultation and Collaboration**

Credits: 3 (NR)
Provides professionals in special education, regular education, and related fields with knowledge and communications skills necessary for collaborative consultation and technical assistance to other educators and service providers.

Prerequisite(s): Teaching licensure, or enrollment in graduate degree program in education.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDSE 665 - Families of Children with Special Needs**

Credits: 3 (NR)
Focuses on strategies for developing culturally appropriate family-professional partnerships to benefit children with special needs. Explores theories and research that support a family-centered approach. Includes family and professional rights and responsibilities in the special education process.

Equivalent to ECED 524

Prerequisite(s): Admission to the Early Childhood Special Education program or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**EDSE 667 - Cognitive Development of Diverse Young Children**

Credits: 3 (NR)
Explores conflicting views about how young children think and learn. Addresses cognitive theoretical approaches of leading
researchers, and emphasizes their relevance to educational practice. Addresses characteristics of children with cognitive disabilities, children from multilingual and multicultural backgrounds, and those living in poverty, along with the educational implications of those characteristics. Requires field experience.

Prerequisite(s): Admission to the Graduate School of Education.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDSE 669 - Interdisciplinary Approach for Children with Sensory and Motor Disabilities

Credits: 3 (NR)  
Emphasizes positioning, handling, and adaptive strategies. Focuses on understanding the roles of related disciplines in collaborative planning and service delivery.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDSE 701 - Legal Issues and Special Populations

Credits: 3 (NR)  
Offers a study of the impact of legislation and litigation on the education of special populations emphasizing IDEA and Section 504. Topics of study include emerging trends in special education based on interpretation of landmark court cases related to disability, legal updates on policies and procedures for exceptional learners, and discussion of the guiding principles of special education law when addressing the needs of special populations.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDSE 702 - Managing Resources for Special Education Programs

Credits: 3 (NR)  
Examines development and delivery of specialized programs for exceptional learners. Topics include implementation of Individualized Education Plans via Universal Design, financial and human resource allocation and management, effective supervision and evaluation, and student outcome documentation.

Prerequisite(s): None

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0

EDSE 703 - Creating a Collaborative Culture
Provides leaders in school settings with an opportunity to gain the skills needed to facilitate collaborative environments supportive of all learners. Topics of study include the impact of diversity on educational settings, developing a vision effective communication teaming and coteaching techniques, family professional partnerships, implementing schoolwide change initiatives, alternative dispute resolution, and maintaining a positive school climate.

**EDSE 743 - Leadership in Special Education Administration**

Credits: 3 (NR)
Examines leadership issues and applies them to the administration of special education programs. Explores current challenges in the delivery of services for exceptional children through case studies and projects.

Prerequisite(s): None

**EDSE 744 - Current Issues in Special Education**

Credits: 3 (NR)
Helps students develop an understanding of the role of convergent research evidence in addressing current issues in special education practice and policy. Familiarizes students with current issues in special education and the group experimental, single subject, and qualitative research designs used to address these current issues. Students evaluate research studies in terms of their methodological strengths and weaknesses and their part in providing convergent bodies of evidence that can be used for defining practice and policy.

**EDSE 782 - Comprehensive Topics in Special Education: Trends and Issues**

Credits: 3 (NR)
Focuses on current trends and issues in special education and disabilities. Students under the direction of instructor complete individually designed projects addressing major trends and issues in their emphasis area of special education.

Prerequisite(s): Majority of course work.

**EDSE 790 - Internship in Special Education**
Supervised internships that apply university course work to instruction of children and their families in school and community settings.

**Prerequisite(s):** Passing scores on Praxis I prior to final internship, and permission of advisor.

**Notes:** Students enroll in two separate internships appropriate to the area of study for a total of 6 credits. Applications for field internships are due on February 15 for fall; September 15 for spring; and March 1 for summer.

**EDSE 791 - Midpoint Portfolio**

Credits: 1 (NR)
Opportunity for students to develop their portfolio. Serves as the vehicle to assess whether they are meeting the standards of their professional organization, the Council for Exceptional Children.

**Notes:** Must be taken after completion of fourth EDSE prefix course or concurrently with fourth or fifth EDSE prefix course in program.

**Hours of Lecture or Seminar per week:** 1
**Hours of Lab or Studio per week:** 0
**Grading:** Satisfactory/No Credit (S, NC, IP)

**EDSE 792 - Final Portfolio**

Credits: 1 (RD)
Opportunity for students to develop their portfolio. Serves as the vehicle to assess whether they are meeting the standards of their professional organization, the Council for Exceptional Children.

**Corequisite(s):** Must be taken concurrently with last EDSE 790 internship or the last EDSE course in the program.

**Hours of Lecture or Seminar per week:** 1
**Hours of Lab or Studio per week:** 0
**Grading:** Satisfactory/No Credit (S, NC, IP)

**EDSE 793 - Internship in Early Childhood Special Education**

Credits: 1-6 (RT)
Supervised internships that apply university coursework to instruction of children and their families in school and community settings. Students enroll in both infant/toddler (3 credits) and pre-school (3 credits) internships.

**Prerequisite(s):** Admission to the Early Childhood Special Education Certificate or permission of instructor; passing Praxis I and VCLA scores.
EDSE 794 - Special Topics

Credits: 1-6 (RD)
Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

EDSE 797 - Advanced Topics in Education

Credits: 1-6 (RD)
Advanced study of selected topics in education for students preparing for doctoral studies or who have been admitted to the PhD program in education.

Notes: May be repeated for credit with CEHD approval.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Graduate Special

EDSE 841 - Intervention Research in Special Education

Credits: 3 (NR)
Provides advanced graduate students with opportunities for in-depth study, analysis, and discussion of original intervention research in special education. Emphasizes analyzing research methodology, coding original intervention research, analyzing results, synthesizing findings, formulating future research questions relevant to individuals with disabilities, and gaining an understanding of the submission process for conferences and publications.

Prerequisite(s): Admission to PhD in education program, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

EDSE 842 - Application of Research Methodology in Special Education

Credits: 3 (NR)
Provides knowledge and skills in the application of research methodology in special education. Topics include methods for conducting survey research, experimental and quasi-experimental research, research involving correlation and regression, and
qualitative research. Emphasizes application to specific issues in special education research.

**Prerequisite(s):** Admission to PhD in education program, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDSE 843 - Leadership in Special Education Administration

Credits: 3 (NR)  
Examines leadership issues and applies them to the administration of special education programs. Explores current challenges in the delivery of services for exceptional children through case studies and projects.

**Prerequisite(s):** Admission to PhD in education program, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### EDSE 844 - Current Issues in Special Education

Credits: 3 (NR)  
Develops understanding of the role of convergent research evidence in addressing current issues in special education practice and policy. Describes current issues in special education and the group experimental, single subject, and qualitative research designs used to address these current issues. Students evaluate research studies in terms of methodological strengths and weaknesses, and their part in providing convergent bodies of evidence that can be used for defining practice and policy.

**Prerequisite(s):** Admission to PhD in education program, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### Sport Management (SPMT)

Offered by the College of Education and Human Development

### SPMT 201 - Introduction to Sport Management

Credits: 3 (NR)  
Introduces sport management profession. Primary focus is on sport industry, including professional sport entertainment, amateur sport entertainment, for-profit sport participation, nonprofit sport participation, sporting goods, and sport services.

**Notes:** Open to non majors.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
SPMT 202 - Mental Skills for Sport Performance

Credits: 2 (NR)
Introduces mental skills training for sport performance used within the field of sport and exercise psychology. Demonstrates mental practice techniques to be practiced and assessed.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall.

SPMT 241 - Practicum

Credits: 3 (NR)
Paid or voluntary experience in sport industry setting. Work sites chosen by students after receiving approval of faculty supervisors.

Prerequisite(s): SPMT 201. Majors in BS HFRR SPMT only. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 3

SPMT 302 - Sport and Ethics

Credits: 3 (NR)
Investigates moral issues in sport and judgments about right and wrong behavior among athletes, coaches, spectators, and others.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 304 - Sport, Culture, and Society

Credits: 3 (NR)
Analyzes sport from educational, political, economic, and cultural perspectives.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 318 - Gender and Racial Issues in Sport

Credits: 3 (NR)
Investigates dominant gender and racial ideologies, and their influence on sport.
SPMT 320 - Psychology of Sport

Credits: 3 (NR)
Psychological theories of personality, motivation, and anxiety explored in sport environment. Examines social-psychological research on audience effects, team cohesion, leadership, and fan behavior.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 321 - America Through Baseball

Credits: 3 (NR)
This course is designed for the student to gain an understanding of the past and present role of baseball in American culture. The course focuses on the development of professional baseball over the past 160 years and the ways in which the history of America as a nation and culture can be "read" through baseball.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 322 - Football and American Culture

Credits: 3 (NR)
Designed for the student to gain an understanding of the past and present role of football in American culture. Focuses on the development of college, professional and high school football over the past 120 years and contemporary issues in football culture are analyzed such as debates over racial symbols and mascots, the question of professionalizing division one college football, and tailgating and televisual football cultures.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 323 - America and the Modern Olympics

Credits: 3 (NR)
This course is designed to provide students an understanding of the role played by the United States in the modern Olympic movement. The primary focus is on the United States relationship with the modern Olympics from the earliest days of the games up through the Cold War period and beyond.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
SPMT 405 - Sport Operation and Planning

Credits: 3 (NR)
Principles and techniques of planning and operating sport facilities. Emphasizes principles and concepts of organization and administration including communication, personnel management, management of physical resources, and risk management. Examines variety of sport operations such as indoor stadiums, athletic field complexes, and managing recreation and intramural activities.

Prerequisite(s): SPMT 201 and completion of 60 hours.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 412 - Sport Marketing and Finance

Credits: 3 (NR)
Investigates principles and processes in sport marketing and finance. Focuses on research and development, sport promotion, sport sponsorship, advertising, merchandising, and distribution of sporting goods.

Prerequisite(s): 60 hours, including SPMT 201, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 420 - Economics and Finance in the Sport Industry

Credits: 3 (NR)
Examines the principles of economics, budgeting, and finance as it applies to the sport industry.

Prerequisite(s): Completion of 60 hours, including SPMT 201, or permission of instructor Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 430 - Sport Communication

Credits: 3 (NR)
Provides a senior-level exploration of the role of sport communication in contemporary cultures. Readings and discussions address questions about how communication about/in sports highlights the importance of sports, the cultural identities of those who engage in sport communication, and the pervasiveness of sport communication practices in industry.

Prerequisite(s): SPMT 201 and general COMM course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**SPMT 440 - Global Perspectives in Sport**

Credits: 3 (NR)
An interdisciplinary examination of sport as a global phenomenon. Historical, cultural, economic, and governance perspectives are considered.

Prerequisite(s): SPMT 201 and completion of 60 hours. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPMT 455 - Governance and Policy in Sport Organizations**

Credits: 3 (NR)
Examines sport organizations focused on both professional and amateur governance structures and processes. The study of policy in educational, nonprofit, and professional sport venues is also addressed.

Prerequisite(s): 60 hours, including SPMT 201, or permission of instructor Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPMT 475 - Sport Management Professional Development Seminar**

Credits: 3 (NR)
This is a seminar format in which students synthesize and apply theories, concepts, and practices in the leadership and management of sport organizations.

Prerequisite(s): SPMT 241 and completion of 75 hours. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPMT 480 - Special Topics in Sport Management**

Credits: 3 (RD)
See course description in the Schedule of Classes. Selected topics reflecting interest in specialized areas of sport management. Announced in advance.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**SPMT 490 - Internship**

Credits: 9-12 (NR)
Paid or voluntary work experience in sport industry settings. Requires minimum period of 10 to 12 weeks of full-time employment. Applies course work, theories, and research to work settings. Work sites chosen by students after approval of faculty supervisors. Includes meetings and assignments before and during the internship.

**Prerequisite(s):** SPMT 475 and completion of 90 hours.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 12
**Grading:** Satisfactory/No credit only

**SPMT 499 - Independent Study**

Credits: 1-3 (NR)
Faculty-directed independent study of approved topics in sport management.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0

**SPMT 551 - Sport in the Global Marketplace**

Credits: 3 (NR)
Explores sport business internationally including the production and consumption of professional and Olympic-linked sports and the impact of globalization on sport.

**Prerequisite(s):** Graduate status or permission of instructor

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**SPMT 555 - The Australian Model of Sport**

Credits: 3 (NR)
Examines the Australian model of sport which has been adopted in many countries. Analyzes government sport policy and the organization and administration of Australian professional sports.

**Prerequisite(s):** SPMT 551 or permission of instructor

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**SPMT 556 - The Global Soccer Industry**
Credits: 3 (NR)
Explores the international soccer industry focusing on major professional leagues, international federations, international movement of players, the production of soccer equipment, legal and social issues.

Prerequisite(s): SPMT 551 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPMT 611 - Sport Marketing and Sales**

Credits: 3 (NR)
Investigates principles and processes in sport marketing. Focuses on research and development, sport promotion, sport sponsorship, advertising, merchandising, and distribution of sporting goods.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPMT 612 - Economics and Financial Management in the Sport Industry**

Credits: 3 (NR)
Examines principles of economics, budgeting, and finance as they apply to the sport industry.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPMT 613 - Strategic Leadership in Sport Organizations**

Credits: 3 (NR)
Examines the theoretical underpinnings and effective strategic processes of leadership in sport organizations. Leader behaviors, characteristics, situational influences, and the cognitive dimensions of leadership will be explored within the organizational context.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SPMT 614 - Legal Issues in Sport**

Credits: 3 (NR)
Examines legal issues as they apply to the sports industry. Course content includes, but is not limited to: tort law, risk management procedures, product liability, constitutional/contract/administrative/statutory law, crowd control/security, personal/professional values, and situational analysis.
SPMT 616 - Sport Operations, Venues, and Event Management

Credits: 3 (NR)
Examines administrative functions and operations, strategic planning, governance structures, policy development, and effective practices in the strategic management of sport programs, including managerial principles for venues and events.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 631 - Theoretical Models of Sport Coaching

Credits: 3 (NR)
Examines the scientific bases for coaching athletes. Emphasizes philosophical underpinnings and theoretical foundations in the psychological, physiological, pedagogical, and managerial bases of sport coaching.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 651 - Sport and International Development

Credits: 3 (NR)
Explores the roles of sport in international development with focus on Africa, Asia, and Latin America. Non-governmental organizations (NGOs), international federations, professional leagues and grassroots initiatives will be examined.

Prerequisite(s): SPMT 551 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SPMT 652 - Governance and Policy in International Sport

Credits: 3 (NR)
Explores sport governance and policy in the international context with focus on international federations, professional leagues and comparative analyses of governmental sporting policies.

Prerequisite(s): SPMT 551 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Sports and Recreation Studies (SRST)

**SRST 598 - Special Topics**

Credits: 1-6 (RD)
Focuses on projects related to sport and/or recreation studies.

**Prerequisite(s):** Graduate standing or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

**SRST 599 - Independent Study in Sport and Recreation Studies**

Credits: 1-3 (RD)
Studies problem area in sport and recreation studies research, theory, or practice under direction of faculty member.

**Prerequisite(s):** Graduate standing and completion of 18 credit hours of graduate coursework in SRST.

**Notes:** Students engage in one-on-one or seminar independent study with an SRST faculty member. The faculty member may be the student's thesis or project supervisor. While SRST 599 is repeatable, 3 credit hours must be designated for Preparation of Thesis or Project Proposal.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

**SRST 606 - Foundations of Sport and Recreation Studies**

Credits: 3 (NR)
Examines the historical development of the Sport and Recreation Studies fields. Explores the interconnection between these phenomena in the context of the social, cultural and economic forces shaping American and global societies.

**Prerequisite(s):** Graduate standing or permission of the instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**SRST 623 - Research Design and Statistical Reasoning**
Introduces basic principles of scientific and scholarly inquiry in Sport and Recreation Studies. Explores the logic and practice of methods and techniques employed in research related to sport and recreation.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**SRST 798 - Master's Project**

Credits: 1-3 (RD)  
Offers capstone experience to enable students to demonstrate their integrative knowledge and skills accrued through study in their concentration area within Sport and Recreation Studies.

**Prerequisite(s):** SRST 623, SRST/EFHP 599: Preparation of Thesis or Project Proposal; or permission of instructor.

**Hours of Lecture or Seminar per week:** 1-3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Summer, Spring.

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**SRST 799 - Master's Thesis**

Credits: 1-6 (RD)  
Explores sport and recreation problem using appropriate research methodology and under supervision of graduate faculty member.

**Prerequisite(s):** SRST 623, SRST/EFHP 599: Preparation of Thesis or Proposal; or permission of instructor.

**Hours of Lecture or Seminar per week:** 1-6  
**Grading:** Satisfactory/No credit only  
**When Offered:** Fall, Summer, Spring

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**Statistics (STAT)**

Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course. This policy does not apply to STAT 250, which follows the normal university policy for repeating undergraduate courses.

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**STAT 250 - Introductory Statistics I**
Credits: 3 (NR)
Elementary introduction to statistics. Topics include descriptive statistics, probability, and estimation and hypothesis testing for means and proportions. Statistical software used for assignments.

Fulfills general education requirement in quantitative reasoning.

Prerequisite(s): High school algebra.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

STAT 344 - Probability and Statistics for Engineers and Scientists I

Credits: 3 (NR)
Introduction to probability and statistics with applications to computer science, engineering, operations research, and information technology. Basic concepts of probability, random variables and expectation, Poisson process, bivariate distributions, sums of independent random variables, central limit theorem, sampling distributions, maximum likelihood and unbiased estimators, confidence interval construction, and hypothesis testing.

Prerequisite(s): MATH 114 or MATH 116. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

STAT 346 - Probability for Engineers

Credits: 3 (NR)
Introduction to probability with applications to electrical and computer engineering, operations research, information technology, and economics. Basic concepts of probability, conditional probability, random variables and moments, specific probability distributions, multivariate distributions, moment-generating functions, limit theorems, and sampling distributions.

Prerequisite(s): MATH 213 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

STAT 350 - Introductory Statistics II

Credits: 3 (NR)
Emphasis on applications. Topics include analysis of variance, multiple regression, and nonparametric inference. A statistical computer package is used for data analysis.

Prerequisite(s): STAT 250.
STAT 354 - Probability and Statistics for Engineers and Scientists II

Credits: 3 (NR)
Continuation of STAT 344. Multivariate probability distributions, variable transformations, regression, analysis of variance, contingency tables, and nonparametric methods. Applications to quality control, acceptance sampling, and reliability.

Prerequisite(s): STAT 346 and a course in Statistics, or STAT 344.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

STAT 362 - Introduction to Computer Statistical Packages

Credits: 3 (NR)
Use of computer packages in statistical analysis of data. Topics include data entry, checking, and manipulation, and use of computer statistical packages for regression and analysis of variance.

Prerequisite(s): STAT 250 or equivalent

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

STAT 435 - Analysis of Experimental Data Using SPSS

Credits: 3 (NR)
Statistical methods for analysis of experimental data, including ANOVA and regression. Parametric and nonparametric inference methods appropriate for a variety of experimental designs are presented along with data analysis using SPSS. Intended primarily for researchers in the natural, social, and life sciences.

Prerequisite(s): STAT 250, STAT 344, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

STAT 455 - Experimental Design
Credits: 3 (NR)
Principles of analysis of variance and experimental design. Topics include computation and interpretation of analysis of variance; multiple comparisons; orthogonal contrasts; and design of experiments, including factorial, hierarchical, and split plot designs. Optional topics may include analysis of covariance; partial hierarchical designs; incomplete block designs; principles of blocking and confounding in $2^n$ experiments; or estimation of variance components. Computer statistical packages are used to perform computations.

**Prerequisite(s):** STAT 350 or 354, and STAT 362 or 501.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Alternate Spring

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**STAT 457 - Applied Nonparametric Statistics**

Credits: 3 (NR)
Introduction to nonparametric methods with applications to the decision and information sciences and operations analysis. Topics covered are testing and estimation for one- and two-sample problems, independent and paired samples, location and dispersion problems, one- and two-way layouts, tests for independence, regression, and discussion of efficiency.

**Prerequisite(s):** STAT 350 or 354, or equivalent.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Offered on an irregular basis at the department's discretion.

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**STAT 463 - Introduction to Exploratory Data Analysis**

Credits: 3 (NR)
Features statistical graphics, maps and simple models used to bring out patterns in data. Introduces statistical software and addresses data access and import. Presents exploratory strategies motivating data transformations. Stresses the cognitive foundations of good graphics. Graphics include dot plots, box plots, Q-Q plots, parallel coordinate plots, scatterplot matrices and linked views. Exploration includes use of dynamic graphics.

**Prerequisite(s):** STAT 350 or 354, or equivalent.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Alternate Spring

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**STAT 474 - Introduction to Survey Sampling**

Credits: 3 (NR)
Introduction to design and analysis of sample surveys. Sample designs include simple random sampling; systematic sampling; and stratified, cluster, and multistage sampling. Analytical methods include sample size determination, ratio and regression estimation, imputation for missing data, and nonsampling error adjustment. Practical problems encountered in conducting a survey are discussed. Methods applied to case studies of actual surveys. Class project may be required.
Prerequisite(s): STAT 346 and a course in Statistics, or STAT 344.

Notes: Recommended for students of decision, information, social sciences, and mathematics.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

STAT 498 - Independent Study in Statistics

Credits: 1-3 (NR)
Directed self-study of special topics of current interest in statistics.

Prerequisite(s): 60 undergraduate credits; must be arranged with instructor and approved by the department chair before registering.

Notes: May be repeated for maximum 6 credits if topics are substantially different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

STAT 499 - Special Topics in Statistics

Credits: 3 (NR)
Topics of special interest to undergraduates.

Prerequisite(s): 60 undergraduate credits and permission of instructor; specific prerequisites vary with nature of topic.

Notes: May be repeated for maximum 6 credits if topics substantially differ.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

STAT 501 - SAS Language and Basic Procedures

Credits: 1 (NR)
Introduction to the SAS Data Step and Base SAS Procedures. Preparation for graduate students in use of SAS for other graduate courses offered by department. Topics include observation and variable structures, data interfaces, formats, functions, and procedures for summarizing and displaying data.

Prerequisite(s): Course in statistics and experience with Microsoft OS.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Spring
STAT 502 - Introduction to SAS/GRAPH

Credits: 1 (NR)
Introduction to SAS/GRAPH. Continued preparation beyond STAT 501 for graduate students in the use of SAS for other graduate courses offered by department. Topics include: an overview of SAS/GRAPH and SAS/GRAPH procedures; introduction to SAS/GRAPH output options; and in-depth coverage of the SGPLOT, GPLOT, and GCHART procedures.

Prerequisite(s): Working knowledge of SAS.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Spring

STAT 503 - SAS Macro Language

Credits: 1 (NR)
Introduction to SAS Macro Language. Continued preparation beyond STAT 501 for graduate students in use of SAS for other graduate courses offered by department. Topics include macro language processing, macro variables, defining and calling macro variables, macro quoting, macro facility error messages, and examples of efficient code using macros.

Prerequisite(s): Working knowledge of SAS.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Spring

STAT 504 - Introduction to SAS/IML

Credits: 1 (NR)
Introduction to SAS/IML, the matrix language within the SAS environment. Topics include defining matrices, performing standard matrix operations, operating on rows and columns of a data table, and writing efficient SAS/IML programs.

Prerequisite(s): Working knowledge of SAS and matrix algebra.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Offered on an irregular basis at the department's discretion

STAT 505 - Introduction to R

Credits: 1 (NR)
Introduction to R syntax, graphical interface, and basic operations. Preparation for graduate students in use of R for other
graduate courses offered by department. Topics include import and export of data; manipulation of R object structures; function creation; package installation; and procedures for simulation, modeling, summarizing data, and producing graphics.

Prerequisite(s): Course in statistics.

Hours of Lecture or Seminar per week: 1  
Hours of Lab or Studio per week: 0  
When Offered: Offered on an irregular basis at the department's discretion

STAT 506 - Introduction to SPSS

Credits: 1 (NR)  
Introduction to SPSS, a widely-used statistical software package in social sciences. Provides an overview of SPSS procedures for manipulating data; summarizing and displaying data; and analyzing data from a variety of experimental designs.

Prerequisite(s): Course in statistics and experience with Microsoft OS.

Hours of Lecture or Seminar per week: 1  
Hours of Lab or Studio per week: 0  
When Offered: Offered on an irregular basis at the department's discretion

STAT 535 - Analysis of Experimental Data Using SPSS

Credits: 3 (NR)  
Statistical methods for analysis of experimental data, including ANOVA and regression. Parametric and nonparametric inference methods appropriate for a variety of experimental designs are presented along with data analysis using SPSS. Intended primarily for researchers in the natural, social, and life sciences.

Prerequisite(s): STAT 250, STAT 344, or equivalent.

Notes: Can be used to satisfy requirements for certificate in federal statistics, but not MS in statistical science. Certificate program students granted credit for only one of STAT 535 or 554.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall

STAT 544 - Applied Probability

Credits: 3 (NR)  
The axioms of probability, conditional probability, random variables and expectation, multivariate and conditional distributions, conditional expectation, order statistics, transformations, moment generating functions, special distributions, limit theorems.

Prerequisite(s): MATH 213 and STAT 346, or permission of instructor.

Hours of Lecture or Seminar per week: 3
STAT 554 - Applied Statistics

Credits: 3 (NR)
Application of basic statistical techniques. Focus is on the problem (data analysis) rather than on the theory. Topics include one- and two-sample tests and confidence intervals for means and medians, descriptive statistics, goodness-of-fit tests, one- and two-way ANOVA, simultaneous inference, testing variances, regression analysis, and categorical data analysis. Normal theory is introduced first with discussion of what happens when assumptions break down. Alternative robust and nonparametric techniques are presented.

Prerequisite(s): STAT 346 or permission of instructor.

Notes: Certificate program students granted credit for only one of STAT 535 or 554.

STAT 560 - Biostatistical Methods

Credits: 3 (NR)
Focuses on biostatistical aspects of design and analysis of biomedical studies, including epidemiologic observational studies and randomized clinical trials. Topics include randomization principle, confounding, ethics in human experimentation, methods of randomization, stratification, primary outcome analyses, covariate-adjusted analyses, epidemiologic measures, and sample size and power computation.

Equivalent to STAT 660 (2011-2012 Catalog)

Prerequisite(s): STAT 554 or STAT 535; and a working knowledge of a statistical software package, such as SAS or SPSS.

STAT 574 - Survey Sampling I

Credits: 3 (NR)
Design and implementation of sample surveys. Covers components of a survey; probability sampling designs to include simple random, systematic, Bernoulli, proportional to size, stratified, cluster and two-stage sampling; and ratio and regression estimators. Discusses practical problems in conducting a survey. Methods applied to case studies of actual surveys. Class project required.

Prerequisite(s): STAT 346 and a course in Statistics, or STAT 344

Hours of Lecture or Seminar per week: 3
STAT 634 - Case Studies in Data Analysis

Credits: 3 (NR)
Examination of a wide variety of case studies illustrating data-driven model building and statistical analysis. With each case study, various methods of data management, data presentation, statistical analysis, and report writing are compared.

Prerequisite(s): STAT 554 and working knowledge of SAS, or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall

STAT 645 - Stochastic Processes

Credits: 3 (NR)
Selected applied probability models, including Poisson processes, discrete- and continuous-time Markov chains, renewal and regenerative processes, semi-Markov processes, queuing and inventory systems, reliability theory, and stochastic networks. Emphasis on applications in practice, as well as analytical models.

Equivalent to OR 645

Prerequisite(s): OR 542 or STAT 544, or permission of instructor.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall

STAT 652 - Statistical Inference

Credits: 3 (NR)
Fundamental principles of estimation and hypothesis testing. Topics include limiting distributions and stochastic convergence, sufficient statistics, exponential families, statistical decision theory and optimality for point estimation, Bayesian methods, maximum likelihood, asymptotic results, interval estimation, optimal tests of statistical hypotheses, and likelihood ratio tests.

Equivalent to CSI 672

Prerequisite(s): STAT 544 with a grade of B- or better, and STAT 554 with grade of B- or better. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Spring
STAT 655 - Analysis of Variance

Credits: 3 (NR)
Single and multifactor analysis of variance, planning sample sizes, introduction to the design of experiments, random block and Latin square designs, and analysis of covariance.

Prerequisite(s): STAT 544, STAT 554, and working knowledge of SAS. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Spring

STAT 656 - Regression Analysis

Credits: 3 (NR)
Simple and multiple linear regression, polynomial regression, general linear models, subset selection, step-wise regression, and model selection. Also covered are multicollinearity, diagnostics, and model building as well as the theory and practice of regression analysis.

Equivalent to CSI 676

Prerequisite(s): STAT 544, STAT 554, matrix algebra, and working knowledge of SAS. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

STAT 657 - Nonparametric Statistics

Credits: 3 (NR)
Distribution-free procedures for making inferences about one or more samples. Tests for lack of independence, association or trend, and monotone alternatives are included. Measures of association in bivariate samples and multiple classifications are discussed. Both theory and applications are covered. Students are introduced to appropriate statistical software.

Prerequisite(s): STAT 544 and 554. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Fall

STAT 658 - Time Series Analysis and Forecasting
Modeling stationary and nonstationary processes, autoregressive, moving average and mixed model processes, autocovariance functions, autocorrelation functions, partial autocorrelation functions, spectral density functions, identification of models, estimation of model parameters, and forecasting techniques.

Equivalent to CSI 678.

Prerequisite(s): STAT 544 or equivalent. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Fall

**STAT 662 - Multivariate Statistical Methods**

Credits: 3 (NR)
Standard techniques of applied multivariate analysis. Topics include review of matrices, T square tests, principle components, multiple regression and general linear models, analysis of variance and covariance, multivariate ANOVA, canonical correlation, discriminant analysis, classification, factor analysis, clustering, and multidimensional scaling. Computer implementation via a statistical package is an integral part of the course.

Prerequisite(s): STAT 544, STAT 554, matrix algebra, and working knowledge of SAS. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Spring

**STAT 663 - Statistical Graphics and Data Exploration I**

Credits: 3 (NR)
Introduces statistical graphics that show distribution features and functional relationships in the presence of noise. Introduces cognitive research guidance for graphics design and reasoning. Stresses quantitative comparisons from multiple perspectives. Features new micromaps designs for spatial and temporal comparisons. Introduces R, the grammar of graphics, and dynamic graphics software.

Equivalent to CSI 773

Prerequisite(s): STAT 554 and a programming course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

**STAT 664 - Bayesian Inference and Decision Theory**
Credits: 3 (NR)
Introduces decision theory and relationship to Bayesian statistical inference. Teaches commonalities, differences between Bayesian and frequentist approaches to statistical inference, how to approach a statistics problem from the Bayesian perspective and how to combine data with informed expert judgment in a sound way to derive useful and policy-relevant conclusions. Teaches necessary theory to develop firm understanding of when and how to apply Bayesian and frequentist methods, and practical procedures for inference, hypothesis testing, and developing statistical models for phenomena. Teaches fundamentals of Bayesian theory of inference, including probability as a representation for degrees of belief, likelihood principle, use of Bayes Rule to revise beliefs based on evidence, conjugate prior distributions for common statistical models, and methods for approximating the posterior distribution. Introduces graphical models for constructing complex probability and decision models from modular components.

Equivalent to SYST 664/CSI 674

Prerequisite(s): STAT 544 or 554, or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Spring

STAT 665 - Categorical Data Analysis

Credits: 3 (NR)
Analyzes cross-classified categorical data in two and higher dimensions. Topics include association tests and measures of association in two- and three-dimensional contingency tables, logistic regression, and log linear models. SAS is used extensively for data analysis.

Prerequisite(s): STAT 656 and working knowledge of SAS. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Spring

STAT 668 - Survival Analysis

Credits: 3 (NR)
Survival Analysis is a class of statistical methods for studying the occurrence and timing of events. In medical research, the events may be deaths, and the objective is to determine factors affecting survival times of patients following treatment, usually in the setting of clinical trials. Methods can also be applied to the social and natural sciences and engineering where they are known by other names (reliability, event history analysis). Concepts of censored data, time-dependent variables, and survivor and hazard functions are central. Nonparametric methods for comparing two or more groups of survival data are studied. The Cox regression model (proportional hazards model), Weibull model, and the accelerated failure time model are studied in detail. Concepts are applied to analysis of real data from major medical studies using SAS software.

Prerequisite(s): STAT 544, STAT 554, and working knowledge of SAS. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Fall
STAT 674 - Survey Sampling II
Credits: 3 (NR)
Continuation of STAT 574. Regression estimators for complex sampling designs, domain estimation, two-phase sampling, weighting adjustments for nonresponse, imputation, nonresponse models, measurement error models, introduction to variance estimation. Applications to case studies of actual surveys.

Prerequisite(s): STAT 574. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Offered on an irregular basis at the department’s discretion.

STAT 689 - Topics in Statistics
Credits: 1-3 (RD)
Special topics of interest to graduate students in statistics.

Equivalent to STAT 789 (2011-2012 Catalog)

Prerequisite(s): Permission of instructor; specific prerequisites vary with the nature of the topic.

Notes: May be repeated for maximum of 6 credits if topics substantially differ.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

STAT 719 - Computational Models of Probabilistic Reasoning
Credits: 3 (NR)
Introduces theory and methods for building computationally efficient software agents that reason, act, and learn environments characterized by noisy and uncertain information. Covers methods based on graphical probability and decision models. Students study approaches to representing knowledge about uncertain phenomena, and planning and acting under uncertainty. Topics include knowledge engineering, exact and approximate inference in graphical models, learning in graphical models, temporal reasoning, planning, and decision making. Practical model building experience is provided. Students apply what they learn to semester-long project of their choosing.

Equivalent to OR 719/CSI 775

Prerequisite(s): STAT 652 or SYST/STAT 664, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Spring
STAT 751 - Computational Statistics

Credits: 3 (NR)
Covers basic computationally intensive statistical methods and related methods, which would not be feasible without modern computational resources. Covers nonparametric density estimation including kernel methods, orthogonal series methods and multivariate methods, recursive methods, cross validation, nonparametric regression, penalized smoothing splines, the jackknife and bootstrapping, computational aspects of exploratory methods including the grand tour, projection pursuit, alternating conditional expectations, and inverse regression methods.

Equivalent to CSI 771

Prerequisite(s): STAT 544, STAT 554, and STAT 652. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Fall

STAT 756 - Alternative Regression Methods

Credits: 3 (NR)
Presents several modern regression methodologies that are useful in data analysis when some of the assumptions of linear regression theory fail to hold. Topics include non-linear regression, quantile regression, robust regression, and computational methods for fitting these models.

Prerequisite(s): STAT 652, STAT 656, and working knowledge of SAS.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Spring

STAT 758 - Advanced Time Series Analysis

Credits: 3 (NR)
Mathematical modeling and methods for model identification and forecasting of nonstationary and seasonal time series data (ARIMA models), multivariate time series, and state-space models.

Prerequisite(s): STAT 658. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Offered on an irregular basis at the department’s discretion.

STAT 760 - Advanced Biostatistical Methods

Credits: 3 (NR)
Advanced statistical methods in the drug development process. Provides the theoretical statistical basis for the design and
analysis of pharmaceutical clinical trials. Topics include the theory of randomization, randomization-based inference, restricted, response-adaptive, and covariate-adaptive randomization, the modern theory of group sequential monitoring, statistical aspects of determination of dose-response relationships.

Prerequisite(s): STAT 652, STAT 656, and working knowledge of statistical programming language. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Spring

STAT 763 - Statistical Graphics and Data Exploration II

Credits: 3 (NR)
Addresses data set size and human comprehension challenges. Introduces case and variable reduction methods, and overview production. Incorporates cognitive science guidance. Utilizes data mining models and visual analytic algorithms to find patterns and prioritize graphics. Addresses applications from both information and scientific visualization. Tracks advances in web graphics including citizen science projects harnessing the visual power of thousands of people.

Prerequisite(s): STAT 663 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Alternate Spring

STAT 765 - Advanced Topics in Categorical Data Analysis

Credits: 3 (NR)
Covers advanced techniques for categorical data analysis and the theoretical basis for the analysis of categorical data. Topics include: models for multinomial responses, matched pairs, repeated measures, and ordinal data; random effects models; asymptotic theory for parametric models; theory for maximum likelihood and alternative estimation methods; and exact inference. Statistical software packages are used extensively for data analysis.

Prerequisite(s): STAT 652 and STAT 665. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Offered on an irregular basis at the department’s discretion.

STAT 771 - Spatial Data Analysis

Credits: 3 (NR)
Presents analysis techniques for spatially-indexed or spatially-correlated data that arise in many areas of science, including medicine, transportation, and atmospheric sciences. Focus is on data analysis rather than theory, though theory will necessarily be covered. Topics include analysis of point patterns, trend and surface estimation, and spatial regression.

Prerequisite(s): STAT 652, STAT 656, and working knowledge of R and SAS.
STAT 772 - Statistical Learning

Credits: 3 (NR)
The course focuses on statistical learning theory by introducing the statistical and optimization background essential for developing new efficient statistical learning algorithms. Also discusses applications of statistical learning algorithms to the solution of important problems in many areas of science.

Equivalent to CSI 772

Prerequisite(s): STAT 652 / CSI 672, or permission of instructor.

STAT 773 - Statistical Methods for Longitudinal Data Analysis

Credits: 3 (NR)
Volume modern statistical approaches to the analysis of longitudinal data, i.e., data collected repeatedly on experimental units over time (or other conditions). Topics include linear mixed effects models, generalized linear models for correlated data (including generalized estimating equations), and computational issues and methods for fitting models.

Prerequisite(s): STAT 652, STAT 656, and working knowledge of SAS. Prerequisite enforced by registration system.

STAT 796 - Independent Studies/Directed Readings

Credits: 1-3 (NR)
Reading and research on a specific topic in statistics under guidance of graduate faculty member.

Prerequisite(s): Permission of instructor and department’s graduate coordinator.

STAT 798 - Master's Research Project
Credits: 3 (NR)
Project chosen and completed under guidance of graduate faculty member that results in acceptable technical report.

Prerequisite(s): 9 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

STAT 799 - Master's Thesis

Credits: 3 (RD)
Project chosen and completed under guidance of graduate faculty member that results in acceptable technical report and oral defense.

Prerequisite(s): 9 graduate credits, and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

STAT 871 - Statistical Data Mining

Credits: 3 (NR)
Covers basic concepts, computational complexity, data preparation and compression, databases and SQL, rule-based machine learning and probability, density estimation, exploratory data analysis, cluster analysis and pattern recognition, artificial neural networks, classification and regression trees, correlation and nonparametric regression, time series, and visual data mining.

Prerequisite(s): STAT 554 or 663, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Offered on an irregular basis at the department's discretion

STAT 876 - Measure and Linear Spaces

Credits: 3 (NR)
Measure theory and integration; convergence theorems; theory of linear spaces and functional analysis; and probability theory. The theory of linear spaces includes normed linear spaces, inner product spaces, Banach and Hilbert spaces, Sobolev spaces, and reproducing kernels. Topics include wavelets, applications to stochastic processes, and nonparametric functional inference.

Equivalent to CSI 876

Prerequisite(s): STAT 544 and MATH 315.

Hours of Lecture or Seminar per week: 3
STAT 877 - Geometric Methods in Statistics

Credits: 3 (NR)
Develops foundations of geometric methods for statistics. Topics include n-dimension Euclidian geometry; projective geometry; differential geometry, including curves, surfaces, and n-dimensional differentiable manifolds; and computational geometry, including computation of convex hulls, tessellations of two-, three-, and n-dimensional spaces, and finite element grid generation. Examples include applications to scientific visualization.

Equivalent to CSI 877

Prerequisite(s): STAT 751 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Offered on an irregular basis at the department's discretion

STAT 889 - Advanced Topics in Statistics

Credits: 3 (RD)
Advanced topics not occurring in regular sequence.

Prerequisite(s): Doctoral standing and permission of instructor.

Notes: May be repeated for a maximum of 12 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

STAT 896 - Advanced Directed Reading

Credits: 3 (NR)
Individualized study with a graduate faculty member in the Department of Statistics. Syllabus and grading criteria must be preapproved by the PhD in Statistical Science Program Director.

Prerequisite(s): Admission to PhD in Statistical Science Program. Permission of PhD in Statistical Science Program Director and permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

STAT 971 - Probability Theory
Credits: 3 (NR)
A rigorous measure-theoretic treatment of probability. Includes expectation, distributions, laws of large numbers and central limit theorems for independent random variables, characteristic function methods, conditional expectations, martingales, strong and weak convergence, and Markov chains.

Equivalent to CSI 971.

Prerequisite(s): STAT 544 and MATH 315. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

STAT 972 - Mathematical Statistics I

Credits: 3 (NR)
Focuses on theory of estimation. Includes method of moments, least squares, maximum likelihood, and maximum entropy methods. Details methods of minimum variance unbiased estimation. Topics include sufficiency and completeness of statistics, Fisher information, Cramer-Rao bounds, Bhattacharyya bounds, asymptotic consistency and distributions, statistical decision theory, minimax and Bayesian decision rules, and applications to engineering and scientific problems.

Equivalent to CSI 972.

Prerequisite(s): STAT 652/CSI 672 or equivalent, and either STAT 876/CSI 876 or STAT 971/CSI 971. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 1-12
Hours of Lab or Studio per week: 0
When Offered: Fall

STAT 973 - Mathematical Statistics II

Credits: 3 (NR)
Continuation of STAT 972/CSI 972. Concentrates on theory of hypothesis testing. Topics include characterizing decision process, simple versus simple hypothesis tests, Neyman-Pearson Lemma, uniformly most powerful tests, unbiasedness and invariance of tests, and randomized and sequential tests. Applications of testing principles made to situations in normal distribution family and other families of distributions.

Equivalent to CSI 973

Prerequisite(s): STAT 972/CSI 972. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

STAT 990 - Dissertation Topic Presentation
Credits: 1 (NR)
Students put together a professional presentation of a research proposal and present it for critique to fellow students and interested faculty.

Equivalent to IT 990, CS 990.

Prerequisite(s): Completion of all course requirements for PhD, or permission of instructor.

Notes: May be repeated with change of research topic, but credit towards doctoral degree is given once.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

STAT 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Work on research proposal that forms basis for doctoral dissertation.

Notes: May be repeated. No more than 24 credits of STAT 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

STAT 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Formal record of commitment to doctoral dissertation research under direction of faculty member in statistics.

Prerequisite(s): Admission to candidacy.

Notes: May be repeated as needed; no more than 24 credits of STAT 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

Systems Engineering (SYST)

Offered by the Volgenau School of Engineering.

Students may attempt an undergraduate course taught by the Volgenau School of Engineering twice. A third attempt requires approval of the department offering the course.
SYST 100 - Engineering Systems in a Complex World

Credits: 3 (NR)
This course introduces students to the engineering profession and its place in a global society. Students will use case studies and historical analyses to think strategically and globally about the management and execution of engineering systems in the context of culture, environment, politics and economics, and learn how to employ such analyses as engineering decision-making tools. Students will be required to critically analyze articles and books, and work in groups to investigate and present topics of current national and international relevance.

Fulfills general education requirement in global understanding.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Fall

SYST 101 - Understanding Systems Engineering

Credits: 3 (NR)
Introduces systems engineering and curriculum for BS in field. Introduces large and small systems, and explains them through some hands-on experiences. Key concepts include understanding requirements for system and translation of system-level requirements to component-level requirements. Several different kinds of example systems presented and discussed: objectives, major components, how system works, and major design issues. Each student gives similar presentation on system of choice. Students working in groups design, develop, and test system, and give oral presentation. Students responsible for writing several short papers on curriculum and presentations they have heard.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
When Offered: Spring

SYST 198 - Independent Study in Systems Engineering

Credits: 1-3 (RT)
Must be arranged with instructor and approved by department chair before registering. Directed self-study of special topics of current interest in systems engineering.

Notes: May be repeated for maximum 6 credits if topics are substantially different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

SYST 210 - Systems Design

Credits: 3 (NR)
Systems engineering design and integration process, development of functional, physical, and operational architectures. Emphasizes requirements engineering, functional modeling for design, and formulation and analysis of physical design
alternatives. Introduces methods, software tools for systems engineering design.

**Hours of Lecture or Seminar per week:** 2-4  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**SYST 220 - Dynamical Systems I**

Credits: 3 (NR)  
Introduces modeling of dynamical systems. Formulation of mathematical models from system descriptions, including computer, biological, economic, transportation, and mechanical systems. Analytical and numerical methods for solving models and studying their behavior. Discrete-time and continuous time systems. Linear and nonlinear systems. Introduction to computer modeling using MATLAB.

**Prerequisite(s):** MATH 114 and PHYS 160

**Corequisite(s):** MATH 214, MATH 203, and SYST 221.

**Hours of Lecture or Seminar per week:** 3-6  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring

**SYST 221 - Systems Modeling Laboratory**

Credits: 1 (NR)  
Companion laboratory to SYST 220. Emphasizes system design and analysis using computer modeling environment MATLAB. Simulation and numerical solutions of continuous dynamic systems. Use of built-in functions and construction of macros. Graphical presentation of results.

**Prerequisite(s):** CS 112.

**Corequisite(s):** SYST 220.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3  
**When Offered:** Spring

**SYST 320 - Dynamical Systems II**

Credits: 3 (NR)  
Continuation of SYST 220 with emphasis in continuous-time systems. Translational, rotational, and electrical systems. Block diagrams and state variable models. Systems analysis in time domain and frequency domain. Analysis of control systems.

**Prerequisite(s):** SYST 220, MATH 203, 214; PHYS 260, 261.

**Hours of Lecture or Seminar per week:** 3
**SYST 330 - Systems Methods**

Credits: 3 (NR)
Analysis methods of system engineering design and management. Decision analysis, economic models and evaluation, optimization in design and operations, probability and statistical methods, queuing theory and analysis, management control techniques, reliability and maintainability analysis, and economic and life-cycle cost analysis. Laboratory exercise with different software programs included.

Prerequisite(s): MATH 114

Corequisite(s): STAT 344 and SYST 221.

**SYST 335 - Discrete Systems Modeling and Simulation**

Credits: 3 (NR)
Introduces basic concepts of modeling complex discrete systems by computer simulation. Topics include Monte-Carlo methods, discrete-event modeling, specialized simulation software, and statistics of input and output analysis.

Equivalent to OR 335

Prerequisite(s): CS 211 or grade of C or better in IT 206 or equivalent; and STAT 344, or STAT 346, or MATH 351, or grade of C or better in STAT 250.

Corequisite(s): None.

**SYST 371 - Systems Engineering Management**

Credits: 3 (NR)
Study of basics of systems engineering management. Includes engineering economics, planning, organizing, staffing, monitoring, and controlling process of designing, developing, and producing system to meet stated need in effective and efficient manner. Discusses management tools, processes, and procedures, including various engineering documentation templates, managerial processes, and dealing with personnel issues.

Prerequisite(s): SYST 210

Corequisite(s): SYST 330.
**SYST 420 - Network Analysis**

Credits: 3 (NR)
Network nomenclature. Elementary graph theory. Linear and nonlinear network models: multicommodity flow, mathematical games and equilibria on networks, network design and control; dynamic network models; applications to transportation, telecommunications, data communications, and water resource systems.

Prerequisite(s): OR 441 and MATH 213.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
When Offered: Fall

**SYST 421 - Classical Systems and Control Theory**

Credits: 3 (NR)

Equivalent to ECE 421

Prerequisite(s): Grade of C or better in ECE 220.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
When Offered: Fall, Spring, Summer

**SYST 460 - Introduction to Air Traffic Control**

Credits: 3 (NR)
Introduction to Air Traffic Control (ATC) for those who plan professions in the air transportation industry. Surveys the entire field, presenting the history of ATC and how it came to be as it is, the technology on which the system is based, the procedures used by controllers to meet the safety and efficiency goals of the system, the organizational structure of the FAA, challenges facing the system, and means under investigation to meet these challenges. Some fieldwork will be required to acquire and analyze airport operational data. A brief introduction to airport design will be discussed.

Prerequisite(s): Senior standing or graduate standing

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
When Offered: Fall
SYST 461 - Air Transportation System Engineering

Credits: 3 (NR)
Focuses on the theory and practice of system engineering in a national air transportation system. Stresses the application of mathematical techniques to analyze and design complex network transportation systems, airports, airspace, airline schedules, and traffic flow.

Prerequisite(s): SYST 460 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

SYST 465 - Pricing in Optimization and Game Theory

Credits: 3 (NR)
Allocation of limited resources among competing activities to maximize the outcome or minimization of expenses required to produce a given assortment of goods and services are two typical problems faced by any economic institution. Mathematical modeling of such problems and finding efficient mathematical tools for solving them are two main goals of modern optimization theory. Pricing limited resources, goods, and services is the key instrument for theoretical analysis of complex economical systems. Pricing theory can also give rise to numerical methods for finding optimal solutions and economic equilibrium. Fundamental tools in pricing theory are the classical Lagrangian and Lagrange multipliers for constrained optimization. Covers the basic ideas and methods of linear programming and matrix games. Particular emphasis to pricing for both theoretical analysis and numerical methods.

Equivalent to ECON 496/MATH 493

Prerequisite(s): MATH 203 or 216, and OR 441, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

SYST 469 - Human Computer Interaction

Credits: 3 (NR)
Covers principles of human-computer interaction, including information processing design, cognitive models, ergonomics, and design metaphors. Students learn to evaluate interface design in terms of effectiveness, efficiency, and cost.

Prerequisite(s): IT/STAT 250, IT 108.

Notes: Students who receive credit for SYST 470 may not receive credit for this course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
SYST 470 - Human Factors Engineering

Credits: 3 (NR)
Human information processing, inferential analysis, biases and heuristics in human information processing, support systems to aid in human information processing, human-system interaction, and software systems engineering considerations.

Prerequisite(s): SYST 210 and STAT 344.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

SYST 473 - Decision and Risk Analysis

Credits: 3 (NR)
Studies analytic techniques for rational decision making that address uncertainty, conflicting objectives, and risk attitudes. Covers modeling uncertainty; rational decision making principles; representing decision problems with value trees, decision trees, and influence diagrams; solving value hierarchies, decision trees and influence diagrams; defining and calculating the value of information; incorporating risk attitudes into the analysis; and conducting sensitivity analyses.

Prerequisite(s): STAT 344 or STAT 346 or MATH 351 or grade of C or better in STAT 250

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 480 - Economic Systems Design I: Principles and Experiments

Credits: 3 (NR)
Introduces design principles used in developing systems used to allocate resources. Students required to participate in experiment demonstrations of different allocation mechanisms. Students are also exposed to experimental methods in economics and market design.

Equivalent to ECON 440

Prerequisite(s): OR 441

Corequisite(s): SYST 465.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 489 - Senior Seminar
Credits: 3 (NR)
Introduces several important topics in systems engineering, providing additional experience in writing and giving presentations, and obtaining feedback on curriculum for BS in systems engineering. Several lectures devoted to ethics; writing and making presentations also covered. Students attend technical lectures and write paper. Students also required to write long paper on new technology. Instructor and guest lecturers present material not part of required course load to expand horizons. Examples are "knowledge-based" design, enterprise-wide reengineering, electronic commerce, and optimization by "natural analogy" (simulated annealing, neural networks, genetic algorithms). In addition, students work in teams to critique and redesign curriculum. Each group delivers written product, and provides at least one briefing to class. Best critique and redesign presented to faculty.

Fulfills writing intensive requirement in the major.

**Corequisite(s):** SYST 490

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

### SYST 490 - Senior Design Project I

Credits: 3 (NR)
First part of capstone course in systems engineering program. Students apply knowledge they have gained to group project. During first semester, students perform concept definition and requirements analysis. Plan for carrying out project is developed, culminating in proposal presented to faculty at end of semester.

**Prerequisite(s):** Grade of C or better in SYST 335, grade of C or better in SYST 371, and 90 satisfactory credits toward BS in systems engineering.

**Corequisite(s):** SYST 320, SYST 470, SYST 473, and OR 441.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 1  
**When Offered:** Fall

### SYST 491 - Industrial Project

Credits: 1-3 (NR)
Semester-long work experience in systems engineering in industrial or governmental organization. Work supervised jointly by systems engineer from sponsoring organization and department faculty member. Project and arrangements for supervision must be approved by student's faculty advisor. Periodic reports, written final report, and presentation are required.

**Prerequisite(s):** 75 credits toward BS in Systems Engineering; SYST 330; GPA of at least 3.00; must be arranged with instructor and approved by department faculty chair before registering.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3-9
SYST 495 - Senior Design Project II

Credits: 3 (NR)
Second part of capstone course. Design project plans formulated in SYST 490 are reviewed and modified. Additional instruction on documentation and project management is given. Design project completed; formal report prepared, presented, and evaluated. Students are strongly recommended to take STAT 354 before enrolling in STST 490/495.

Fulfills general education requirement in synthesis.

Prerequisite(s): Grade of C or better in SYST 490.

Corequisite(s): SYST 330, STAT 354.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 2
When Offered: Spring

SYST 498 - Independent Study in Systems Engineering

Credits: 1-3 (NR)
Directed self-study of special topics of current interest in systems engineering.

Prerequisite(s): 60 credits toward BS in systems engineering, and GPA of at least 3.00; must be arranged with instructor and approved by department chair before registering.

Hours of Lecture or Seminar per week: 1-4
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring, Summer

SYST 499 - Special Topics in Systems Engineering

Credits: 3 (NR)
Topics of special interest to undergraduates.

Prerequisite(s): 60 credits toward BS in systems engineering; specific prerequisites vary with nature of topic.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 500 - Quantitative Foundations for Systems Engineering

Credits: 3 (NR)
Provides quantitative foundations necessary for core courses in systems engineering and operations research master's program, and certificate program in C4I. Topics include vectors and matrices, infinite series, partial differentiation, multiple integrals, differential and difference equations; linear systems; Laplace and Z-transforms, and probability theory. Students receive graduate credit for this course, which, when used on plan of study, extends minimum credit requirements for degree.
Equivalent to CSI 600

Prerequisite(s): MATH 203, 213.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

**SYST 505 - Introduction to Systems Engineering**

Credits: 3 (NR)
Introduction to systems engineering with a focus on information technology systems. Emphasize development of analytical, technical, management, and teamwork skills through exercises in planning, documentation, presentation, and the creative process of IT engineering design. Use SysML as the language for analyzing and describing case studies in systems engineering. This course cannot be counted toward the MSSE degree or the PhD IT degree.

Notes: This course was taught to students in the MS/AIT program in Spring 2009 as SYST 659 Topics in Systems Engineering. The course will become part of the MS/AIT curriculum.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SYST 510 - Systems Definition and Cost Modeling**

Credits: 3 (NR)
Comprehensive examination of methods and processes for the identification and representation of system requirements. Investigation of the systems acquisition life cycle with emphasis on requirements definition, including functional problem analysis. Examination of the systems engineering definition phase including requirements, problem analysis, definition, and functional economics. Specification of functional and nonfunctional requirements, and associated requirements proto-typing. Functional economic analysis, including the use of prevailing cost estimation models and planning and control of common operating environments. Lecture and group project including creation of requirements and use of cost estimation model.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

**SYST 512 - Systems Engineering for Design and Development**

Credits: 3 (NR)
Prerequisite(s): SYST 510 or equivalent.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

SYST 513 - Total Systems Engineering, Reengineering and Enterprise Integration

Credits: 3 (NR)
Principles of strategic quality, including TQM. Quality standards including ISO9000 and 14000. Organizational leadership, cultures, and process maturity, reengineering. Quality, organization learning, and reengineering approaches to enable information integration and management and environment and framework integration in the systems engineering of knowledge intensive systems. Emphasis is placed on the role of integrated product and process design teams, standard and commercial off-the-shelf products in enterprise integration. Architecture-driven system characteristics are studied, as is transition management of legacy systems.

Prerequisite(s): SYST 510 or 520.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 520 - System Engineering Design

Credits: 3 (NR)
System design and integration methods are studied and practiced, including structured analysis and object-oriented based techniques. Life cycle of systems is addressed, including definition and analysis of life cycle requirements. Software tools are introduced and used for the systems engineering cycle. Identification of preliminary architectures. Students are expected to develop a system design for a system of their choice using both the structured analysis and object-oriented techniques presented in class and they will make presentations on these designs.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SYST 521 - Network Analysis

Credits: 3 (NR)

Equivalent to OR 643
**Prerequisite(s):** MATH 213 and 203 or equivalent; OR 441 or 541.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

**SYST 530 - System Management and Evaluation**

Credits: 3 (NR)  
Provides techniques for evaluating cost and operational effectiveness of system designs and systems management strategies. Discusses performance measurement, work breakdown structures, cost estimating, quality management, configuration management, standards, and case studies of systems from different application areas.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**SYST 540 - Analysis for Systems Management**

Credits: 3 (NR)  
Operations research techniques and their application to managerial decision making. Mathematical programming, Markov processes, queuing theory, inventory models, PERT, CPM, and computer simulation are covered, as well as use of contemporary computer software for problem solving. Case-study approach to problem solving is used.

Equivalent to OR 540

**Prerequisite(s):** MATH 108 and STAT 250 or DESC 210; or equivalent.

**Notes:** Students who have taken OR 541 or OR 542 and OR MS majors do not receive credit.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring

**SYST 542 - Decision Support Systems Engineering**

Credits: 3 (NR)  
Studies design of computerized systems to support individual or organizational decisions. Teaches systems engineering approach to decision support system (DSS) development. DSS is end product of development process, and process is key to successfully integrating DSS into organization. Any DSS is built on a theory (usually implicit) of what makes for successful decision support in given context. Empirical evaluation of specific DSS and the underlying theory should be carried on throughout development process. Course examines prevailing theories of decision support, considers issues in obtaining empirical validation for theory, and discusses empirical support that exists for theories considered. Students design decision support system for semester project.

Equivalent to EEP 602
Prerequisite(s): SYST 301 or graduate standing.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall

**SYST 560 - Introduction to Air Traffic Control**

Credits: 3 (NR)  
Introduction for those who plan professions in aviation industry. Surveys entire field, presenting history of ATC and how it came to be, technology on which system is based, procedures used by controllers to meet safety and efficiency goals, organizational structure of the FAA, challenges facing system, and means under investigation to meet these challenges. Involves some field work for data collection and analysis. Class project requiring system simulation required.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall

**SYST 563 - Research Methods in Systems Engineering and Information Technology**

Credits: 3 (NR)  
Provides foundation for one of the most important activities in systems engineering: information gathering to support drawing conclusions and making decisions about design options and process improvements. Develops understanding of scientific process, use of empirical evidence to support and refute scientific hypotheses, and use of scientific information in decision-making. Covers different sources of scientific evidence: designed experiments, quasi-experiments, field studies, surveys, and case studies. Discusses process of formulating testable hypotheses, and methods of measurement including approaches to measuring soft, hard-to-quantify factors. Presentation of results is discussed. Students do project involving empirical research.

Prerequisite(s): STAT 344 and 354, or equivalent.

Hours of Lecture or Seminar per week: 3  
Hours of Lab or Studio per week: 0  
When Offered: Fall

**SYST 571 - Systems Engineering Management**

Credits: 3 (NR)  
Study of more advanced topics in systems engineering management. Seminar style; students expected to read selections from current literature as well as make presentations and produce papers on engineering management topics. Examines issues such as multiproject management, quality programs, and the impacts of process change on the organization. Focuses strongly on the practical impacts of various system engineering management techniques and practices on projects, organizations, and personnel.

Prerequisite(s): SYST 471 or 530.
SYST 573 - Decision and Risk Analysis

Credits: 3 (NR)
Study of analytic techniques for rational decision making that address uncertainty, conflicting objectives, and risk attitudes. Covers modeling uncertainty; rational decision-making principles; representing decision problems with value trees, decision trees, and influence diagrams; solving value hierarchies, decision trees, and influence diagrams; defining and calculating the value of information; incorporating risk attitudes into the analysis; and conducting sensitivity analysis.

Prerequisite(s): STAT 346 or equivalent.

Notes: Offered concurrently with SYST 473. Students may not receive credit for both SYST 473 and 573.

SYST 574 - Quality Control and Process Management

Credits: 3 (NR)
Provides fundamentals of quality control and process management methodologies that are applicable in manufacturing industries. Introduces the basic concepts of engineering process and product quality management techniques. Provides exposition of fundamentals of lean Six Sigma and total quality management and maintainability.

Equivalent to OR 574

Prerequisite(s): Graduate standing or permission of instructor.

SYST 576 - Manufacturing Systems Analysis

Credits: 3 (NR)
Provides fundamentals of modeling and analysis of general manufacturing systems that are also applicable to semiconductor manufacturing. Introduces the basic concepts of scheduling, inventory control, and enterprise resource management.

Equivalent to OR 576

Prerequisite(s): Graduate standing or permission of instructor.
SYST 580 - Introduction to C4I Systems

Credits: 3 (NR)
This course provides a high-level introduction to fundamental principles of Command, Control, Communication, Computing, and Intelligence (C4I). The principles and techniques are applicable to a wide range of civilian and military situations. The sensing, fusion, and situation assessment processes for decision making as well as the concepts of modeling, simulation, and C4 architectures are discussed. Several cases studies of C4I systems are also included.

Prerequisite(s): Graduate standing.

Notes: Students who take SYST 680 may not take SYST 580.

SYST 588 - Financial Systems Engineering I: Introduction to Options, Futures, and Derivatives

Credits: 3 (NR)
This course is an introduction to financial engineering. Financial engineering is a cross-disciplinary field which relies on mathematical finance, numerical methods, and computer simulations to make trading, hedging, and investment decisions. This course will introduce basic types of derivatives, such as forward, futures, swaps, and options; as well as financial models such as Brownian motion, Ito's formula, and Black-Scholes model.

Equivalent to OR 588.

Prerequisite(s): Eng. or Math Graduate standing, or permission of instructor.

SYST 611 - System Methodology and Modeling

Credits: 3 (NR)
Provides broad yet rigorous introduction to methodologies. Emphasizes systems modeling and performance. Topics include system model and behavior analysis linear and nonlinear systems, discretization and linearization, optimization, dynamic programming and optimal control. Methodologies address system performance issues, and assist in the evaluation of alternative system designs. Resource allocation for planning and control introduced.

Prerequisite(s): SYST 500 or equivalent.

Hours of Lecture or Seminar per week: 3
SYST 619 - Introduction to Architecture Based Systems Engineering

Credits: 3 (NR)

Equivalent to ECE 672

Prerequisite(s): SYST 510 or 520, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 620 - Discrete Event Systems

Credits: 3 (NR)
Introduces modeling and analysis of discrete event dynamical systems. Course covers elements of discrete mathematics and then focuses on Petri Net models and their basic properties. Relation to other discrete event models of dynamical systems.

Equivalent to ECE 673

Prerequisite(s): SYST 611 or ECE 521, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 621 - Systems Architecture Design

Credits: 3 (NR)
Intensive study of relationships between different types of architecture representations and methodologies used to obtain them. Approaches based on systems engineering constructs, such as structured analysis and software engineering constructs, including object orientation, are used to develop architecture representations or views and to derive an executable model of the information architecture. Executable model is then used for behavior analysis and performance evaluation. Roles of systems architect and systems engineer are discussed. Examples from current practice including the C4ISR architectures are used.

Equivalent to ECE 674

Prerequisite(s): SYST 619/ECE 672 and SYST 620/ECE 673 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**SYST 622 - System Integration and Architecture Evaluation.**

Credits: 3 (NR)

Equivalent to ECE 675

**Prerequisite(s):** SYST 620/ECE 673 and SYST 621/ECE 674 or permission of instructor.

**Corequisite(s):** SYST 621/ECE 674.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**SYST 631 - Systems Engineering of Information Architectures**

Credits: 3 (NR)
An intensive study of the relationships between different types of architecture representations and the methodologies used to obtain them. Approaches based on systems and software engineering constructs, such as object orientation and structured analysis are used to develop architecture representations or views. The roles of the systems architect and the systems engineer are discussed. The function of executable model of the information architecture in deriving requirements is presented. Examples from current practice including C4ISR architectures are included.

Equivalent to ECE 678

**Prerequisite(s):** SYST 520 and SYST 619/ECE 672.

**Notes:** This course does not meet the requirements for the MS/SE degree.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

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**SYST 632 - System Integration and Architecture Evaluation**

Credits: 3 (NR)

Equivalent to ECE 679

**Prerequisite(s):** SYST 631/ECE 678.

**Notes:** This course does not meet the requirements for the MS SE degree.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
SYST 659 - Topics in Systems Engineering

Credits: 3 (RT)
Topics not covered in department's regular systems engineering offerings. Course content may vary each semester depending on instructor and the perception of students' needs.

Prerequisite(s): Permission of instructor.

Notes: Course may be repeated once for credit.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring

SYST 660 - Air Transportation Systems Modeling

Credits: 3 (NR)
Introduces wide range of current issues in air transportation. Issues include public policy toward industry, industry economics, system capacity, current system modeling capability, human factors considerations, safety analysis and surveillance systems, and new technological developments. Develops broad understanding of contemporary and future issues. Knowledge evaluated through class discussions, take-home midterm exam, and term project to be completed by end of semester.

Equivalent to OR 660

Prerequisite(s): SYST 460/560 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

SYST 664 - Bayesian Inference and Decision Theory

Credits: 3 (NR)
Introduces decision theory and relationship to Bayesian statistical inference. Teaches commonalities, differences between Bayesian and frequentist approaches to statistical inference, how to approach statistics problem from Bayesian perspective, and how to combine data with informed expert judgment in a sound way to derive useful and policy relevant conclusions. Teaches necessary theory to develop firm understanding of when and how to apply Bayesian and frequentist methods; and practical procedures for inference, hypothesis testing, and developing statistical models for phenomena. Teaches fundamentals of Bayesian theory of inference, including probability as a representation for degrees of belief, likelihood principle, use of Bayes Rule to revise beliefs based on evidence, conjugate prior distributions for common statistical models, and methods for approximating the posterior distribution. Introduces graphical models for constructing complex probability and decision models from modular components.

Equivalent to STAT 664 and CSI 674

Prerequisite(s): STAT 544 or 554, or equivalent.
**SYST 671 - Judgment and Choice Processing and Decision Making**

Credits: 3 (NR)
How do people make judgments and decisions? Course presents initial review of scientific literature directed toward answering this question, and emphasizes importance when performing decision analysis and designing systems to support judgment and decision processes.

Equivalent to OR 671

**Prerequisite(s):** STAT 344/354.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

**SYST 674 - Dynamic Programming**

Credits: 3 (NR)
Theory and practice of dynamic programming, i.e., optimal sequential decision making over time in the presence of uncertainties is covered. Stresses intuition, the mathematical foundations being for the most part elementary. It will introduce the theory, applications (finance, engineering, and biology), and computational aspects of dynamic programming for deterministic and stochastic problems.

Equivalent to OR 674

**Prerequisite(s):** OR 442 or OR 542 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**SYST 675 - Reliability Analysis**

Credits: 3 (NR)
Introduction to component and system reliability, their relationship, and problems of inference. Topics include component lifetime distributions and hazard functions, parameter estimation and hypothesis testing, life testing, accelerated life testing, system structural functions, and system maintainability.

**Prerequisite(s):** OR 675/STAT 654

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
**SYST 677 - Statistical Process Control**

Credits: 3 (NR)
Introduces concepts of quality control and reliability. Acceptance sampling, control charts, and economic design of quality control systems are discussed, as are system reliability, fault-free analysis, life testing, repairable systems, and role of reliability, quality control, and maintainability in life-cycle costing. Role of MIL and ANSI standards in reliability and quality programs considered.

Equivalent to OR 677/STAT 677

**Prerequisite(s):** STAT 554 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**SYST 680 - Principles of Command, Control, Communications, Computing, and Intelligence (C4I)**

Credits: 3 (NR)
Broad introduction to fundamental principles of command, control, communications, computers, and intelligence (C4I). Principles and techniques applicable to wide range of civilian and military situations. Discusses modeling and simulation of combat operations. Studies in detail sensing, fusion, and situation assessment processes. Derives optimal decision-making rules; discusses concepts of C4 architectures; and develops tools to evaluate and design C4 systems such as queuing theory.

Equivalent to ECE 670/OR 683

**Prerequisite(s):** ECE 528, SYST 611, or OR 542; or equivalent.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall

**SYST 683 - Modeling, Simulation, and Gaming**

Credits: 3 (NR)
Develops methods for designing combat models and games. Existing combat models critical to the C4I process. Exercises and games demonstrate value of properly developed C4I modules in a combat simulation.

**Prerequisite(s):** MATH 213, SYST 500 or equivalent, and graduate standing.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**SYST 684 - Sensor Data Fusion**
Examines design issues in multisensor fusion systems. Studies use of probability, evidence, and possibility theories for object identification. Studies Bayesian networks, blackboard architectures, and spatial and temporal reasoning for situation assessment.

**Prerequisite(s):** SYST 680 or ECE 670.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### SYST 688 - Financial Systems Engineering II: Derivative Products and Risk Management

Credits: 3 (NR)  
Financial engineering is a cross-disciplinary field which relies on mathematical finance, numerical methods, and computer simulations to make trading, hedging, and investment decisions, as well as facilitating the risk management of those decisions. This course will focus on risk management for both market risk and credit risk. It will cover a broad range of derivatives products and hedging strategies with emphasis on how risks are managed in financial institutions.

**Prerequisite(s):** OR/SYST 588 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.

### SYST 698 - Independent Study and Research

Credits: 3 (RD)  
Study of a selected area in systems engineering or C3I under the supervision of a faculty member. Written report required.

**Prerequisite(s):** Graduate standing, completion of at least two core courses, permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring, Summer

### SYST 699 - Masters Project

Credits: 3 (NR)  
Capstone project course for MS/SE program. Key activity is completion of a major applied team project resulting in an acceptable technical report and oral briefing. Student should plan to take this course in the last semester of studies.

Equivalent to SYST 798 (2011-2012 Catalog)

**Prerequisite(s):** 21 graduate credits in OR or SYST.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall, Spring.
SYST 735 - Advanced Stochastic Simulation

Credits: 3 (NR)
Special topics and recent developments in Monte Carlo simulation methodology for discrete-event stochastic systems. Contents vary; possible topics include statistical analysis of simulation output data, random number and random variate generation, variance reduction techniques, sensitivity analysis and optimization of simulation models, distributed and parallel simulation, object-oriented simulation, and specialized applications.

Equivalent to OR 735

Prerequisite(s): OR 635 or permission of instructor.

Notes: May be repeated for credit when topics are distinctly different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 740 - Advances in Multi-Modeling

Credits: 3 (NR)
Focuses on the inter-operation of multiple models expressed in different modeling languages but which draw from the same data set: i.e., multi-modeling. Socio-technical systems often require a variety of modeling tools to define their operation accurately. An ontology based approach is used to analyze the validity of a proposed modeling architecture and workflow to address a specific issue

Equivalent to ECE 760.

Prerequisite(s): SYST 620 or ECE 673 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring.

SYST 750 - Advanced Topics in Systems Engineering

Credits: 3 (RD)
Advanced topics not covered in department's regular systems engineering offerings. Course content may vary each semester depending on instructor and the perception of students' needs. May be repeated for credit when topics are distinctly different.

Prerequisite(s): 600-level course that varies with content of course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall, Spring
SYST 760 - Special Topics in Command, Control, Communications, Computing, and Intelligence Systems Engineering

Credits: 3 (NR)
Special topics in the C4I area, with different content in different terms. Representative areas include quantitative evaluation of C4 systems, applications of artificial intelligence in C4 systems, and military communications systems.

Prerequisite(s): SYST 680.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 763 - Research Methods in Systems Engineering and Information Technology

Credits: 3 (NR)
Examines alternative paradigms of scientific research and their applicability to research in information technology. Topics include fundamental elements of scientific investigation, basic principles of experimental design and statistical induction, philosophy of science and its relation to the information technology sciences, and case studies of information technology research.

Equivalent to IT 763/OR 763

Prerequisite(s): STAT 554.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 781 - Data Mining and Knowledge Discovery

Credits: 3 (NR)
Statistical and computational methods and systems for deriving user-oriented knowledge from large databases and other information sources, and applying knowledge to support decision making. Information sources can be in numerical, textual, visual, or multimedia forms. Covers theoretical and practical aspects of current methods and selected systems for data mining, knowledge discovery, and knowledge management, including those for text mining, multimedia mining, and web mining.

Equivalent to STAT 781

Prerequisite(s): One of the following courses: CS 687, CS 650, INFS 614, STAT 663, STAT 664, or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

SYST 799 - Master's Thesis
Research project chosen and completed under the guidance of a graduate faculty member, which results in a technical report acceptable to a three-member faculty committee, and an oral defense.

Prerequisite(s): 21 graduate credits and permission of instructor.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit

**SYST 842 - Models of Probabilistic Reasoning**

Credits: 3 (NR)
Survey of alternative views about how incomplete, inconclusive, and possibly unreliable evidence might be evaluated and combined. Discusses Bayesian, Baconian, Shafer-Dempster, and Fuzzy systems for probabilistic reasoning.

Equivalent to IT 842/OR 842

Prerequisite(s): STAT 544 or OR 681, or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SYST 850 - Topics in Systems Integration Engineering**

Credits: 3 (RD)
Covers lifecycles; large systems comprising heterogeneous components; human, organizational, and technological basis for integration; societal and cultural basis; conceptual frameworks; structure, function, and purpose of industry; risk management; user requirements and functional specifications; bid and proposal process; systems integration and federal government; standards; integration of systems and federations of systems; integrated process and product development; architectures; systems management and cost estimation; reengineering; quality management; increasing returns to scale, network effects, and path dependency issues; and systems integration ecology and evolutionary systems integration

Prerequisite(s): SYST 510 or 520.

Notes: May be repeatable for a maximum of six credits within the degree if topics are substantially different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**SYST 888 - Distributed Estimation and Multisensor Tracking and Fusion**

Credits: 3 (NR)
Centralized and distributed estimation theory, hierarchical estimation, tracking and data association, multisensor multitarget tracking and fusion, distributed tracking in distributed sensor networks, track-to-track association and fusion, and Bayesian networks for fusion.
Equivalent to ECE 753/OR 888

**Prerequisite(s):** ECE 734 or SYST 611.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**SYST 944 - The Process of Discovery and Its Enhancement in Engineering Applications**

Credits: 3 (NR)
Studies ingredients of imaginative reasoning as they concern efficient discovery of new ideas and valid evidential test of them. Topics include different interpretations of Peirce's theory of abductive reasoning and other forms of reasoning, Hintikka's analysis of process of inquiry, and current attempts to design systems that provide assistance in discovery-related or investigative activities.

Equivalent to OR 944/ IT 944

**Prerequisite(s):** SYST 842 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**Systems Engineering and Operations Research (SEOR)**

Offered by the Volgenau School of Engineering

**SEOR 750 - Advanced Topics in Systems Engineering and Operations Research**

Credits: 3 (RD)
Advanced topics, applications, or recent developments in the interface of systems engineering and operations research. Course content may vary each semester depending on instructor and the perception of students' needs. May be repeated for credit when topics are distinctly different.

**Prerequisite(s):** 600-level course that varies with content of course.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0
**When Offered:** Fall, Spring

**SEOR 796 - Directed Reading and Research**

Credits: 1-3 (RD)
Reading and research on specific topic in systems engineering or operations research under direction of faculty member.
Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

SEOR 998 - Doctoral Dissertation Proposal

Credits: 1-12 (RD)
Work on research proposal that forms basis for doctoral dissertation.

Notes: May be repeated. No more than 24 credits of SEOR 998 and 999 may be applied to doctoral degree requirements.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

SEOR 999 - Doctoral Dissertation

Credits: 1-12 (RD)
Formal record of commitment to doctoral dissertation research under direction of faculty member approved by SEOR Department.

Prerequisite(s): Admission to doctoral candidacy.

Notes: May be repeated as needed.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

Taxation (TAX)

Offered by the School of Management

TAX 700 - Federal Income Taxation

Credits: 3 (NR)
Federal income tax concepts and procedures related to individual taxpayers and business entities. Emphasis on research and planning based on the Internal Revenue Code, Treasury Regulations, and administrative and judicial sources of tax law.

Prerequisite(s): Admission to the MS Tax program or permission of the director

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
TAX 701 - Accounting Methods and Periods

Credits: 1.5 (NR)
Tax accounting methods including the cash and accrual methods, inventory accounting, installment sales, accounting changes, and various book-tax difference. The accounting periods are also studied.

Prerequisite(s): Admission to the MS Tax program or permission of the director

Corequisite(s): TAX 700

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TAX 702 - Tax Practice and Procedures

Credits: 1.5 (NR)
Professional responsibilities and ethics, tax research, tax penalties, practice before the IRS, tax policy, and other issues.

Prerequisite(s): Admission to the MS Tax program or permission of the director.

Corequisite(s): TAX 700

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TAX 703 - Corporate Taxation

Credits: 3 (NR)
Concepts and principles that relate to federal income taxation of corporations and their shareholders. Emphasis on research of fact situations. Coverage includes the organization and capitalization of a corporation, nonliquidated and liquidated distributions, penalty taxes, collapsible corporations, and determinants of the income tax base of corporations.

Prerequisite(s): Admission to the MS Tax program or permission of the director

Corequisite(s): TAX 700

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TAX 704 - Corporate Mergers and Acquisitions

Credits: 1.5 (NR)
Introduces taxable and tax-deferred methods of combining, dividing, and recapitalizing existing corporations. Analyzes the effects on the corporation(s), its attributes, and its shareholders.

Prerequisite(s): Admission to the MS Tax program or permission of the director. TAX 700
**TAX 705 - Affiliated Corporations**
Credits: 1.5 (NR)
Studies consolidated tax return regulations and filing requirements for affiliated corporations.

Prerequisite(s): Admission to the MS Tax program or permission of the director. TAX 703

**TAX 706 - Partnership Taxation**
Credits: 3 (NR)
Major aspects of taxation affecting partners and partnerships. Emphasis on tax planning and detailed study of the Internal Revenue Code, Treasury Regulations, and case law governing these areas.

Prerequisite(s): Admission to the MS Tax program or permission of the director

Corequisite(s): TAX 700

**TAX 710 - Federal Estate and Gift Taxation**
Credits: 3 (NR)
Concepts and principles that relate to federal estate and gift taxation and the federal income taxation of estates, trusts, and beneficiaries. Emphasis on estate tax planning and a detailed study of the Internal Revenue Code, Treasury Regulations, and case law governing these areas.

Prerequisite(s): Admission to the MS Tax program or permission of the director. TAX 700

**TAX 711 - International Taxation**
Credits: 3 (NR)
Taxation of individuals and corporations with foreign-source income and tax liability to the United States.
Prerequisite(s): Admission to the MS Tax program or permission of the director. TAX 700

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TAX 712 - Seminar in Advanced Tax Policies

Credits: 3 (RD)
Selective analysis of current tax topics addressing important issues in contemporary tax practice. Discussion of two or three major topics. Consult the Schedule of Classes. Course may be repeated for credit with different topics.

Prerequisite(s): Admission to the MS Tax program or permission of the director. TAX 700

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TAX 713 - State and Local Taxation

Credits: 3 (NR)
Detailed analysis of the principal forms of state and local taxation.

Prerequisite(s): Admission to the MS Tax program or permission of the director. TAX 700

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TAX 714 - Pensions and Deferred Compensation

Credits: 3 (NR)
Analysis of the structure, operation, and requirements for obtaining and maintaining IRS approval of tax-qualified pensions, profit sharing, and deferred compensation plans.

Prerequisite(s): Admission to the MS Tax program or permission of the director. TAX 700

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TAX 792 - Management of Professional Service Organizations

Credits: 3 (NR)
This course addresses the management of the modern professional services organizations with special emphasis on the strategic, marketing, human resources, risk management, and ethical and technological issues vital to management.

Prerequisite(s): Admission to the MS Tax program or permission of the director. Completion of 18 hours of MSA or MST
required coursework.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 1-12

Technology Management (TECM)

Offered by the School of Management

TECM 610 - Communications and Leadership

Credits: 2 (NR)
Distinguishes between leadership and management, and focuses on the critical roles and functions of leadership, including communication ability, use of power and influence, providing direction, aligning an organization's systems, motivating a workforce, and creating a culture for effectiveness. It also focuses on strategies for developing oneself as an effective leader.

Prerequisite(s): Admission to Technology Management Program.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

TECM 615 - Decision Making Using Accounting and Financial Data

Credits: 3 (NR)
Provides managers with an overview of the purpose and importance of accounting within the organization and the financial valuation of information technology companies, projects, and product line. Students focus on the economics and analysis of business transactions and their related financial reporting issues from internal and external stakeholder perspectives. Students improve their skills in analyzing financial issues and presenting results in a case analysis framework.

Prerequisite(s): Admission to Technology Management Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TECM 620 - Economics of Technology Management

Credits: 2-3 (NR)
Enables students to build and evaluate economic and business models that can be used to analyze real managerial questions that affect all types of institutions, especially firms in the information technology industry. Students develop a better understanding of the operation of markets in general and the use of various quantitative and qualitative methods when making decisions within the firm. The use of economic analysis allows students to identify and evaluate decision alternatives, the competitive environments of firms, and the factors that influence firm performance, especially in the information technology industry.

Prerequisite(s): Admission to Technology Management Program or permission of the program director.
TECM 635 - Metrics and Statistics for Quality and Project Management

Credits: 2-3 (NR)
Explores current metrics and metric development for quality, intangible assets, and project management as required within information technology companies. Applies statistical tools of best use with these metrics.

Prerequisite(s): Admission to Technology Management Program or permission of the program director.

TECM 640 - Management of Consulting and Technical Professionals

Credits: 1-3 (NR)
Students gain insight into conflict resolution, teamwork, communication, power and influence, career development, and ethics. Helps students understand themselves and those they manage, as they work to be as effective as possible in modern organizations.

Prerequisite(s): Admission to Technology Management Program.

TECM 700 - Business Engineering and Change Management

Credits: 2 (NR)
Visualizing, planning, and implementing transitions in an organization or business unit is fast becoming a key source of competitive advantage. Course provides theory and practice of change management and strategic planning including organizational development and organizational transformation.

Prerequisite(s): Admission to Technology Management Program.

TECM 702 - Interpersonal Dynamics and Teamwork

Credits: 3 (NR)
Develops behavioral skills integral to effective teamwork and interpersonal relationships in work environments. Covers techniques for making group decisions and resolving internal team conflicts, as well as negotiating effectively with outside parties.
Prerequisite(s): Admission to Technology Management Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TECM 703 - Technology Assessment, Evaluation, and Investment

Credits: 3 (NR)
Prepares students to be educated consumers of information technology to maximize strategic advantage of IT to an organization. Information technologies, architectures, and products are categorized and analyzed with a view to develop and maintain the most favorable IT asset portfolio to successfully carry out business goals and strategies. Techniques for making group technology assessments, outsourcing decisions, project bidding, and contract negotiations.

Prerequisite(s): Admission to Technology Management Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TECM 704 - Planning and Control of Projects

Credits: 3 (NR)
Examines advanced topics in project and program management, with specific attention to the issues that managers face to effectively manage programs. This involves managing resources (both internal and external to the organization) and managing within an existing organizational structure. Specific program management topics include advanced topics for project management, program alignment with strategic objective, management of stakeholders, and development and organization of the program office. Strategic and operational tools and metrics also are discussed.

Prerequisite(s): Admission to Technology Management Program.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TECM 720 - Analysis of IT Industries

Credits: 2-4 (NR)
Provides students with an understanding of the impact of information technology on firms and industries and equips them to develop and execute appropriate strategies. Although the emphasis is on information technology firms and industries, a key goal of the course is to better prepare students to respond to a diverse array of information technology challenges. Course work covers the demand and the supply side of information technology, as well as the development of frameworks and analytical tools to help put events, behaviors, and processes into understandable contexts.

Prerequisite(s): Admission to Technology Management Program or permission of the program director. TECM 615 and 620.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0
**TECM 735 - Technology Management Capstone Project**

Credits: 2 (NR)
Teams undertake a strategic evaluation and plan for IT-driven business initiatives. Presentation includes analysis of competitive forces and the value chain; recommendations, including changes in goals and organizational design; plan of action integrating marketing, human resource development, organizational design, finance, and information technology; and implementation plan using theories of communication and change management, to include business case and business plan.

**Prerequisite(s):** Admission to Technology Management Program or permission of the program director.

**Hours of Lecture or Seminar per week:** 2  
**Hours of Lab or Studio per week:** 0  
**Grading:** Special graduate.

**TECM 737 - Capstone Project in Management of Secure Information Systems**

Credits: 1-3 (RD)  
Teams undertake a strategic evaluation and plan for the management of secure information systems. They develop plans that include technical, organizational, and policy aspects. A report is produced and presented to the entire cohort for discussion.

Equivalent to MSEC 720

**Prerequisite(s):** Admission to Executive MS in Management of Secure Information Systems.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Graduate Special  
**When Offered:** Fall, Spring, Summer

**TECM 740 - Management of Client Relationships**

Credits: 1-3 (RD)  
Proposal development, bidding, legal issues of contracts and agreements, formation of commercial partnerships, and new business development. Methods and practices for conducting client need assessment and managing deviations of scope. Application of principles of marketing information systems and technology to internal and external customers.

**Prerequisite(s):** Admission to Technology Management Program or permission of the program director. TECM 610 and 630.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**TECM 745 - Business Functions and Operations: Client Industries**
Explores best practices in the IT industry. Students analyze practices in terms of gaining competitive advantage in an industry where the scarcity economic model for products no longer applies. Course work focuses on leading an organization with the IT function.

**Prerequisite(s):** Admission to Technology Management Program.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### TECM 750 - Global IT Management

Credits: 2-4 (NR)  
Students spend a week in an international residency. Emphasizes dealing with technological changes across international markets and amid global developments, virtual organizations, and project management across cultures. Corporate site visits combined with presentations by professors from universities outside the United States and relevant practitioners.

**Prerequisite(s):** Admission to Technology Management Program or permission of the program director.  
TECM 600 and 620.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### TECM 757 - Global Residency

Credits: 1-4 (RD)  
Students spend a week in an international residency. Emphasis is on how other nations deal with management of secure information system, the management of those systems, and related public policy issues. Corporate site visits are combined with presentations by professors from universities outside the United States and relevant practitioners. Students are required to write a paper summarizing their observations and attend pre-residency preparatory sessions.

Equivalent to MSEC 710

**Prerequisite(s):** Admission to Executive MS in Management of Secure Information Systems.

**Hours of Lecture or Seminar per week:** 1-4  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring, Summer

### Telecommunications (TCOM)

Offered by the Volgenau School of Engineering

### TCOM 500 - Modern Telecommunications
Comprehensive overview of telecommunications, including current status and future directions. Topics include review of evolution of telecommunications; voice and data services; basics of signals and noise, digital transmission, network architecture and protocols; local area, metropolitan and wide area networks and narrow band ISDN; asynchronous transfer mode and broadband ISDN; and satellite systems, optical communications, cellular radio, personal communication systems, and multimedia services. Examples of real-life networks illustrate basic concepts and offer further insight.

Equivalent to ECE 540

**Prerequisite(s):** TCOM 575, or equivalent.

**Hours of Lecture or Seminar per week:** 3

**Hours of Lab or Studio per week:** 0

**TCOM 501 - Data Communications and Local Area Networks**

Credits: 1.5 (NR)

Network concepts; Open Systems Interconnection (OSI) reference model and layering; data coding; analog/digital communications review; physical layer and data link control; switching and multiplexing; commercial digital link standards; Data Link Layer Control (DLC) functions. DLC protocols; flow control; error control; link management; common link protocols. Local area networks (LANs); basics, definitions, media access control; LAN performance; LAN standards, rings and buses; bridging and frame relay.

**Prerequisite(s):** Graduate standing

**Hours of Lecture or Seminar per week:** 1.5

**Hours of Lab or Studio per week:** 0

**TCOM 502 - Wide Area Networks and Internet**

Credits: 1.5 (NR)

OSI reference model review; packet network layer functions; connection-oriented and connectionless packet switching; X.25 and X.75 standards; SONET and Packet-over SONET; circuit-switched networks and control signaling; congestion control and traffic management; virtual private networks; introduction to network management; routing methods; Internet working; introduction to Internet protocol concepts; OSI transport layer client/server model; domain name systems; and telnet.

**Prerequisite(s):** TCOM 501.

**Hours of Lecture or Seminar per week:** 1.5

**Hours of Lab or Studio per week:** 0

**TCOM 503 - Fiber Optic Communications**

Credits: 1.5 (NR)

Introduction and overview of optical fiber communications systems. Course covers basic elements of fiber optic networks: semiconductor light sources (light emitting diodes and laser diodes), fiber optic waveguides, network system design issues, link budget analysis, and component requirements. Additional topics may include wave length division multiplexed and Time-
Division Multiplexed networks and optical switching systems.

Prerequisite(s): TCOM 500

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TCOM 504 - Asynchronous Transfer Mode Networks

Credits: 1.5 (NR)
Asynchronous Transfer Mode (ATM) concept, protocols, services, and applications. The emphasis is on the standards and technology of ATM for local and wide area networks. Relation to broadband ISDN; ATM switching, multiplexing and transport; user-network and network-network interface aspects; ATM Adaptation layer; access switching; ATM wide area network switches; design and practice of networks based on ATM technology.

Prerequisite(s): TCOM 500, 501, 502, or equivalent.

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TCOM 505 - Networked Multicomputer Systems

Credits: 1.5 (NR)
Introduces systems engineering of a networked multicomputer system. Studies distributed multicomputer architectures, architecture of a network operating system, and key system components. The focus of this course is on the development of a thin client/server system, requirements analysis of a client/server web computing, system planning and implementation. Includes a study of example multicomputer systems and a discussion of future directions.

Prerequisite(s): TCOM 500, 501, or equivalent.

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TCOM 506 - Personal Communication Systems (PCS)

Credits: 1.5 (NR)
Introduces Personal Communication Systems (PCS). Topics include multiple technical layers of the PCS systems; data link level and network layer protocols, including implementation; mobile station operation and base station operation; and how voice and data services work. Also discusses vital issues of user authentication, privacy, and data or voice encryption.

Prerequisite(s): TCOM 500, 501, 551, and 552 or equivalent.

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0
TCOM 509 - Internet Protocols

Credits: 1.5 (NR)
The Internet Protocol (IP) Suite: principles, protocols, and architecture; Internet working; Internet addressing; IP; routing protocols (RIP, OSPF, BGP); Internet Control Message Protocol; Internet Group Management Protocol; User Datagram Protocol; Transmission Control Protocol; Client-Server Model; Domain Name System; Socket Interface; Internet applications (TELNET, FTP, SNMP, HTTP); Internet security; Internet multicasting; quality-of-service in the Internet (RSVP, DiffServ, MPLS); Mobile IP; Next Generation Internet (Ipv6)

Prerequisite(s): TCOM 501 and 502

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TCOM 510 - Client-Server Architectures and Applications

Credits: 1.5 (NR)
Fundamentals of application engineering for Client/Server (C/S) Internet environments. Review of C/S application architectures and system perspective on C/S middleware. Study of web-based middleware, distributed data managers and SQL middleware, distributed transaction processing middleware, and C/S object technology.

Prerequisite(s): TCOM 500 or ECE 540.

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TCOM 513 - Optical Communications Networks

Credits: 1.5 (NR)
Introduction and overview of current developments in Optical Communication Networks. Emphasizes underlying technologies that make all-optical networks possible. Specific topics include components needed for Wavelength Division Multiplexed Systems and Dense Wavelength Division Multiplexed Systems; tunable wavelength lasers, wavelength add/drop multiplexers, space division switching, and wavelength-routing networks; optical LAN, MAN, and WAN concepts; passive and active wavelength filters, switches and routers; free-space optical networks.

Prerequisite(s): TCOM 503

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TCOM 514 - Basic Switching: Lecture and Laboratory Course

Credits: 3 (NR)
Basic switching techniques and protocols for low and high-speed digital packet networks (Ethernet, Frame Relay, ATM, X.25) are taught within a half semester lecture series, followed by hands-on laboratory for remainder of semester. Real-life scenarios taught in the laboratory element through exercises that involve configuring switches and routers.
Prerequisite(s): TCOM 501 and 502

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 1.5

**TCOM 515 - Internet Protocol Routing: Lecture and Laboratory Course**

Credits: 3 (NR)

Internet Protocol (IP) routing overview; static routing; dynamic routing; default routing; access lists; route redistribution; RIP, OSPF, IGRP, EIGRP, IS-IS, and BGP protocols submitted for comment. Real-life scenarios taught in laboratory element through exercises that involve configuring routers as network elements.

Prerequisite(s): TCOM 501, 502, and 509

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 1.5

**TCOM 516 - Global Positioning System (GPS)**

Credits: 1.5 (NR)

Background in long-range navigation developments; early global systems; space-based systems; GPS and GLONASS systems; system architecture; spacecraft and Earth station characteristics; design concepts of the CA and P GPS signal modes; frequencies, modulation, and other design aspects; clock issues; range and accuracy calculations and limitations; advanced concepts.

Prerequisite(s): TCOM 500

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

**TCOM 518 - Third Generation Cellular Telephony**

Credits: 1.5 (NR)

Introduction to post-second generation cellular systems; benefits and features of third generation (3G) systems; review of air interface standards currently approved for 3G; review of 3G technologies; analysis of competing multiple access methods; transition plans and backward compatibility between 2G, 21/2G, and 3G systems; possible fallback plans.

Prerequisite(s): TCOM 506, 551, and 552.

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

**TCOM 519 - Voice over IP**
Credits: 1.5 (NR)
Concept of transporting voice over Packet Switched Network; typical VoIP network scenarios (campus, multisite private network, calling nationwide and international; communications protocols for VoIP (RTP, RTCP, RFC 1889, H.323); conferencing and security issues; quality issues (delay, mean opinion scores); VoIP network design.

Prerequisite(s): TCOM 501, 502, and 509

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

**TCOM 520 - Economics of Telecommunications**

Credits: 3 (NR)
Management of telecommunications networks; economic concepts in changing climate of telecommunications ownership, deregulation, and privatization; resource allocation fundamentals based on internal rate-of-return, net present value, opportunity costs; valuation of potential acquisitions in broad telecommunications market; financial modeling techniques.

Prerequisite(s): TCOM 500

Corequisite(s): TCOM 521.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TCOM 521 - Systems Engineering for Telecommunications Management**

Credits: 3 (NR)
Advanced software principles, techniques, and processes for designing and implementing complex telecommunication systems. Planning and implementation of telecommunications systems from strategic planning through requirements, initial analysis, general feasibility study, structured analysis, detailed analysis, logical design, and implementation. Current system documentation through use of classical and structured tools and techniques for describing flows, data flows, data structures, file designs, input and output designs, and program specifications. Practical experience gained through project.

Prerequisite(s): TCOM 500

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TCOM 526 - Advanced Global Positioning System (GPS)**

Credits: 1.5 (NR)
Advanced concepts in global navigation satellite systems (GNSS) such as the American GPS (global positioning system), the European Galileo and the Russian GLONASS (GLObal Navigation Satellite System) System-level description, architecture and design of a wide area augmentation system (WAAS) comprising geostationary satellites overlaying GPS satellites and its vast network of monitoring and control ground stations. The equivalent EGNOS (European Geostationary Navigation Overlay Service), a precursor to Galileo and the Japanese MSAS (Multitransport Satellite-based Augmentation System) Updates on evolving GNSS technology and GNSS backup alternatives.
**Prerequisite(s):** TCOM 516

**Hours of Lecture or Seminar per week:** 1.5  
**Hours of Lab or Studio per week:** 0

### TCOM 529 - Advanced Internet Protocols

**Credits:** 1.5 (NR)  
Presents Link-State Routing Protocols (OSPF, IS-IS): functionality, features, design criteria; TCP Performance Tuning; Routing Architectures: routing vs. forwarding tables, shortest path routing algorithms, Internet architecture; Routing Between Peers: BGP/IGP interactions; Internet Security: IPSec, SSL protocols; Internet Multicasting: Layer 2 and 3 Multicast, functionality and features, IGMP and multicast routing protocols; Mobile IP: mobility, routing and addressing; Next Generation Internet (IPv6): functionality and features, pros and cons; Internet Applications: DNS, TELNET, FTP, SNMP, HTTP, etc.)

**Prerequisite(s):** TCOM 509 or a strong background in networking protocols.

**Hours of Lecture or Seminar per week:** 1.5  
**Hours of Lab or Studio per week:** 0

### TCOM 539 - Advanced Voice over IP

**Credits:** 1.5 (NR)  
Presents VoIP applications using Softswitches: Softswitch paradigm, advanced functionality and features. Different use of Softswitch architecture; VoIP QoS: QoS components, protocols, trade-offs. VoIP Security: Aspects of VoIP vulnerabilities, industry-standard remedies; VoIP network design considerations, traffic forecasting, product and vendor selection criteria; case studies: Enterprise and service provider implementations. Vonage example; Advanced topics (e.g., vendor interoperability issues, business case analysis, and future of VoIP).

**Prerequisite(s):** TCOM 519

**Hours of Lecture or Seminar per week:** 1.5  
**Hours of Lab or Studio per week:** 0

### TCOM 540 - Telecommunications Network Optimization: Routing, Flow Management, and Capacity Modeling

**Credits:** 1.5 (NR)  
Provides state-of-the-art knowledge and techniques to apply operations research knowledge to optimal dimensioning, design and use of telecommunication networks. Includes review of traffic models in telecommunication networks including models for particular streams and multiplexing, as well as multirate and multihour models. Theory, algorithms and computational aspects of linear, network, and integer programming; formulation of telecommunication problems as optimization models, and review of solution strategies. Topics include maximum flow, shortest paths, minimum cost flows; data structure for trees and graphs; applications, modeling, theory and algorithms for optimal location of service facilities (concentrators, multiplexers) in telecommunication networks.

**Prerequisite(s):** TCOM 500
TCOM 541 - Network Design and Pricing

Credits: 1.5 (NR)
Capacity planning, capital budgeting and reliability modeling for determining optimal design. Economic models of pricing alternative telecommunications systems, project selection evaluation, and mechanisms for determining reliability of complex networks. Concentrates on modeling and evaluation. Software tools provided and tested throughout course.

Prerequisite(s): TCOM 540.

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TCOM 542 - Stochastic Models in Telecommunications

Credits: 1.5 (NR)

Prerequisite(s): TCOM 500.

Hours of Lecture or Seminar per week: 1.5
Hours of Lab or Studio per week: 0

TCOM 545 - Reliability and Maintainability of Networks

Credits: 3 (NR)
Stochastic modeling of network reliability, simulation modeling, modeling replacement strategies. Introduces quality control, sampling for acceptance, economic design of quality control systems, and system reliability. Also covers faulty tree analysis, life testing, repairable systems and role of reliability, quality, and maintainability in life-cycle costing.

Prerequisite(s): TCOM 500.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TCOM 546 - Financial Models of Telecommunications Systems

Credits: 3 (NR)
Telecommunication properties and systems. Broadcast, cable, and common carrier capitalization. Pricing, acquisition criteria, and forecasting techniques. Economic analysis of regulations and policies affecting telecommunications. Compares policy objectives
with actual effects of policies, emphasizing economic principles. Determining appropriate discount and hurdle rates, life-cycle costing, evaluating technology horizons, and depreciation concerns will be discussed. Studies the economic analysis of regulations and policies affecting the mass media. Compares policy objectives with actual effects of policies, emphasizing economic principles. Uses economic and sociological theories to analyze impact of information technologies on economic organizations, markets, competitive strategies, and communication policy design.

**Prerequisite(s):** TCOM 500 and 501.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**TCOM 547 - Project Management in Telecommunications**

Credits: 3 (NR)  
Develops integrated approach to managing major telecommunications project; evaluates and uses tools and software for project management, with specific goals of containing costs and time overruns; introduces elements for resolving conflict resolution and applying motivation within project team, and gaining the ability to monitor and control projects in changing environment; develops understanding of unique attributes of major telecommunications systems such as interoperability requirements and international technical standards.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**TCOM 548 - Security and Privacy Issues in Telecommunications**

Credits: 1.5 (NR)  
Introduces philosophy of secure data and voice communications. Topics include cryptography, cipher systems, practical security schemes, confidentiality, authentication, integrity, access control, nonrepudiation, and their integration across telecommunications network. Reviews threats and vulnerabilities in distributed systems.

**Prerequisite(s):** TCOM 500 and TCOM 501.

**Hours of Lecture or Seminar per week:** 1.5  
**Hours of Lab or Studio per week:** 0

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**TCOM 551 - Digital Communication Systems**

Credits: 3 (NR)  
Digital transmission of data, voice, and video. Covers signal digitization; modulation and demodulation; error correction coding; multiple access methods; multiplexing; synchronization; channel equalization; frequency spreading; encryption; transmission codes; digital transmission using bandwidth compression techniques; elements of information theory; and development of link budget evaluation such as system noise temperature, Nyquist filter concepts, antenna gain, and filter bandwidth.

**Prerequisite(s):** TCOM 500.
TCOM 552 - Introduction to Mobile Communications Systems

Credits: 3 (NR)
Introduces mobile communication system design and analysis. Topics include mobile communication channel, access and mobility control, mobile network architectures, connection to fixed network, and signaling protocols for mobile communication systems. Offers examples of mobile communication systems including panEuropean GSM system, North American DAMPS system, and Personal Communication Systems.

Prerequisite(s): TCOM 500 and 551.

TCOM 555 - Network Management Foundations and Applications

Credits: 3 (NR)
Defines and explains techniques that network managers utilize to maintain and improve performance of telecommunications network; network management system; five tasks traditionally involved with network management (fault management, configuration management, performance management, security management, and accounting management); theoretical background in transmission systems sufficient to understand network parameters such as capacity and response times; and specific network management products. Also explores how network performance data should be used for management and when considering upgrades in network architecture.

Prerequisite(s): TCOM 500, 501, and 502.

TCOM 556 - Cryptography and Network Security

Credits: 1.5 (NR)
Broad overview of cryptographic algorithms and mechanisms, and application in today's communication networks. Discusses modern cryptographic techniques such as public key cryptography, digital signatures, secret sharing, key management, key escrow, public key certificates, and public key infrastructure. Covers cryptography on Internet including secure electronic mail, secure WWW, and electronic commerce. Compares, analyzes software implementations of cryptographic algorithms.

Prerequisite(s): TCOM 500 and 548.

TCOM 562 - Network Security Fundamentals
Introduces full spectrum of network security. Topics include taxonomy such as language commonality in incident handling, national strategy to secure cyberspace, and cybersecurity organizations; organizational structure for network defense; best practices, security policy, and threats; actors and tools, countermeasures, vulnerability identification/correction, intrusion detection, and impact assessment; firewalls and intrusion detection systems; antivirus software; active defense; disaster recovery; and law enforcement and privacy issues. Reviews threats and vulnerabilities in network systems based on reports, case studies available in the literature, and actual experience.

**Prerequisite(s):** TCOM 500.

**TCOM 575 - Quantitative Foundations for Telecommunications**

Credits: 3 (NR)
Provides quantitative foundations in mathematical and electrical concepts to permit registration for courses in telecommunications MS degree and certificate programs. Topics include polynomials, exponentials, linear and quadratic equations, graphs and functions, trigonometric functions, radial measure and sine/cosine functions, exponentials and logarithms, basic probability and statistics, fundamentals of matrix algebra and vectors, basic Boolean logic; circuit elements (resistor, capacitor, inductor), basic electrical circuits, units, Ohm's law, Kirchhoff's law, decibel notation.

**Prerequisite(s):** Graduate standing

**Notes:** Course cannot be used for credit in any IT&E graduate degree program.

**TCOM 590 - Selected Topics in Telecommunications**

Credits: 1.5-3.0 (RT)
Selected topics from recent developments and applications in various engineering disciplines within specialty modules 1, 2, and 3 of the TCOM program. The course is designed to help the professional engineering community keep abreast of current developments.

**Prerequisite(s):** Permission of instructor; specific prerequisites vary with the subject of the topic.

**Notes:** The 1.5-credit course lasts for one-half semester (approximately seven weeks) while the 3-credit course lasts for the full semester.

**Hours of Lecture or Seminar per week:** 1.5-3
**Hours of Lab or Studio per week:** 0
Credits: 1.5-3.0 (RD)
Selected topics from recent developments and applications in various engineering disciplines in specialty modules 4 and 5 of TCOM program. Designed to help professional engineering community keep abreast of current developments.

Prerequisite(s): Permission of instructor; specific prerequisites vary with subject of topic.

Notes: The 1.5-credit course lasts for one-half semester (approximately seven weeks); the 3-credit course lasts for full semester.

Hours of Lecture or Seminar per week: 1.5-3
Hours of Lab or Studio per week: 0

TCOM 598 - Independent Study in Telecommunications

Credits: 1.5-3.0 (RD)
Directed self-study of special topics in telecommunications that relate to specialty modules 1, 2, and 3. Topics must be arranged with instructor and approved by program director before registering.

Prerequisite(s): Permission of Instructor and Program Director.

Notes: May be taken for either 1.5 credits or 3.0 credits in fall and spring semesters. No more than total 6 credits may be taken from combination of TCOM 598, 599, 696, and 697 courses for credit in TCOM program.

Hours of Lecture or Seminar per week: 1.5-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

TCOM 599 - Independent Study in Telecommunications

Credits: 1.5-3.0 (RD)
Directed self-study of special topics in telecommunications that relate to specialty modules 4 and 5. Topics must be arranged with instructor and approved by program director before registering.

Prerequisite(s): Permission of Instructor and Program Director.

Notes: May be taken for either 1.5 credits or 3 credits in fall and spring semesters. No more than total 6 credits may be taken from combination of TCOM 598, 599, 696, and 697 for credit in TCOM program.

Hours of Lecture or Seminar per week: 1.5-3
Hours of Lab or Studio per week: 0
Grading: Graduate Special

TCOM 603 - Standards for Advanced Optical Networks

Credits: 3 (NR)
Introduces current and upcoming global optical networking standards. Introduces currently deployed optical networking standards, primarily SONET, and proceeds with evolution of next generation optical networks as envisioned by various standards body. Covers standard work on Automatic Switched Optical Networks being worked on at ITU and Generalized Multi-Protocol
Label Switching being worked on at IETF. Also covers evolution of Ethernet from local area networking to wide area networking, specifically the G.Etna standard that is being developed by ITU, and T1.X1 committee and 802.xxx developed by IEEE.

Prerequisite(s): TCOM 503 and 513

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TCOM 606 - Advanced Mobile Communications Systems**

Credits: 3 (NR)
Introduction to post-second generation cellular systems; benefits and features of third-generation (3G) systems and personal communications services (PCS); review of air interface standards and transmission technologies for mobile and quasi-stationary wireless systems, including cellular networks, satellite networks, indoor systems (Wi-Fi, Personal Local Area Networks, Orthogonal Frequency Multiplexing, Ultra Wide Band technologies); review of network control strategies; investigation of user authentication, privacy, and data and voice encryption aspects. Evolving technology, analysis of competing multiple access methods, transition plans, and backward compatibility between 2G, 21/2 G, 3G, and future systems, with possible fallback plans.

Prerequisite(s): TCOM 552

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TCOM 607 - Satellite Communications**

Credits: 3 (NR)
Topics include introduction to satellite communications systems; historical aspects; orbital mechanics and launchers; satellite components such as payload, orbital maneuvering systems, cooling systems, and antennas; look angle predictions; link budget; overall link design; multiple access such as TDMA, CDMA, ALOHA, TDMA, and MFTDMA; error control for digital satellite links; propagation effects on satellite links; elements of VSAT systems and nongeostationary satellite systems; and direct broadcast satellite services.

Prerequisite(s): TCOM 551.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TCOM 609 - Interior Gateway Protocol (IGP) Routing**

Credits: 3 (NR)
Discusses development of Interior Gateway Protocols, including standards documents; interaction between various interior and exterior gateway protocols; design procedures and implementation aspects; field trial issues; and analysis of latest RFC information posted on IETF web site.

Prerequisite(s): TCOM 509 and 515, or equivalent.
TCOM 610 - Border Gateway Protocol (BGP) Routing

Credits: 3 (NR)
Discusses development of Border Gateway Protocol and its application in today's Internet routing architecture. Covers evolution of Internet, BGP routing standard specifications (RFCs), interaction between various routing protocols, network BGP routing design principals and procedures for enterprise and ISP networks, BGP's real-world implementation and configuration syntax, network scalability and convergence issues, and the latest extension and proposals for new standards.

Prerequisite(s): TCOM 509 and 515, or equivalent.

TCOM 611 - Multi-Protocol Label Switching (MPLS)

Credits: 3 (NR)
Develops full understanding of Multi-Protocol Label Switching (MPLS) theory, technology, and implementation aspects through detailed analysis of MPLS routing concepts and protocol stacks, and completion of major project to reinforce understanding of MPLS.

Prerequisite(s): TCOM 609 or 610

TCOM 660 - Network Forensics

Credits: 3 (NR)
Deals with collection, preservation, and analysis of network-generated digital evidence so it can be successfully presented in civil or criminal court of law. Examines relevant federal laws and private sector applications. Examines capture/intercept of digital evidence, analysis of audit trails, recordation of running processes, and reporting of such information.

Equivalent to CFRS 660

Prerequisite(s): TCOM 509, and working knowledge of computer programming.

TCOM 661 - Digital Media Forensics
Deals with collection, preservation, and analysis of digital media so this evidence can be successfully presented in civil or criminal court of law. Examines relevant federal laws and private sector applications. Examines seizure, preservation, and analysis of digital media.

Equivalent to CFRS 661

**Prerequisite(s):** TCOM 548 and 556, or TCOM 562, and working knowledge of computer operating systems; or permission of instructor.

**TCOM 662 - Advanced Secure Networking**

Credits: 3 (NR)
Advanced technologies in network security that can be applied to enhance enterprise and ISP's network security. Covers network perimeter defense concept and various components for complete layered defense system. Examines each component and its technologies, including TCP/IP protocol vulnerabilities, router access control list (ACL), dynamic ACL, firewall, network address translation (NAT), virtual private network (VPN), IPSec tunnels, intrusion detection system (IDS), routing protocol security, denial-of-service (DOS) attack, DOS detection and mitigation techniques.

**Prerequisite(s):** TCOM 509 and 562, and a working knowledge of network routing protocols.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**TCOM 663 - Operations of Intrusion Detection and Forensics**

Credits: 3 (NR)
Introduces students to network and computer intrusion detection and its relation to forensics. It addresses intrusion detection architecture, system types, packet analysis, and products. It also presents advanced intrusion detection topics such as intrusion prevention and active response, decoy systems, alert correlation, data mining, and proactive forensics.

Equivalent to CFRS 663

**Prerequisite(s):** TCOM 509 and 529 and a working knowledge of computer programming.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

**TCOM 664 - Incident Response Forensics**

Credits: 3 (NR)
This course addresses incident detection, response, and those aspects of computer forensics pertinent to the investigation of trade secret theft, economic espionage, copyright infringement, piracy, and fraud. Procedures for gathering, preserving, and analyzing forensic evidence are discussed in detail and are applied to both computer and network incident response forensics.

Equivalent to CFRS 664

Prerequisite(s): TCOM 509 and TCOM 529.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

TCOM 690 - Advanced Topics in Telecommunications

Credits: 3 (RT)
Advanced topics from recent developments and applications in various engineering disciplines in specialty modules 1, 2, and 3 of TCOM program. Advanced topics chosen so that they do not duplicate existing TCOM courses. Active participation of students encouraged in form of writing and presenting papers in various research areas of advanced topic. Enhances professional engineering community's understanding of breakthrough developments in specific areas.

Prerequisite(s): Permission of instructor; specific prerequisites vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TCOM 691 - Advanced Topics in Telecommunications

Credits: 3 (RD)
Advanced topics from recent developments and applications in various engineering disciplines in specialty modules 4 and 5 of TCOM program. Advanced topics are chosen in such a way that they do not duplicate existing TCOM courses. Active participation of students encouraged in form of writing and presenting papers in various research areas of advanced topic. Enhances professional engineering community's understanding of breakthrough developments in specific areas.

Prerequisite(s): Permission of instructor; specific prerequisites vary.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TCOM 696 - Independent Reading and Research

Credits: 1.5-3.0 (RD)
Study of selected area in specialty modules 1, 2, or 3 under supervision of faculty member. Written report required.

Prerequisite(s): Specified by instructor or advisor.

Notes: No more than total of 6 credits may be taken from combination of TCOM 598, 599, 696, and 697 for credit in TCOM program.
TCOM 698 - Telecommunications Projects Course

Credits: 3 (NR)
To be taken toward end of degree program within any of modules 1, 2, or 3. Primary activity is completing major applied project, preferably with group of two to three people. Secondary goal is consolidating training before graduation so that, in some cases, it may act as capstone course. Students and outside telecommunication industry managers present ideas for projects and, through grouping of students, new skills and approaches may be learned. Some class time used for discussion of projects, either to monitor progress or explore alternative approaches. Readings, class-time discussion of current trends, difficulties, and new opportunities for industry most relevant to module. Concludes with presentations of projects to department faculty.

Prerequisite(s): Graduate standing with at least 18 credits or permission of department.

TCOM 699 - Telecommunications Project Course

Credits: 3 (NR)
Capstone of degree program under the specialty modules 4 or 5. To be taken toward end of degree program. Primary activity is completion of major applied project, preferably as two- to three-person group. Secondary goal is consolidation of training before graduation. Students, outside telecommunication industry managers present ideas for projects. From these ideas, group projects selected. Some classroom time used to discuss projects, to either monitor progress or explore alternative approaches. Readings, class-time discussion of current trends, difficulties, and new opportunities for the industry. Projects presented to department faculty at end of semester.

Prerequisite(s): Completion of at least 24 credits in the MS in Telecommunications program.

TCOM 707 - Advanced Link Design

Credits: 3 (NR)
Topics include advanced satellite link design such as VSAT optimization, intersatellite systems, and propagation mitigation trade-offs; radar link design such as primary and secondary radars, range ambiguities, false alarms, Doppler radar, FM radar, radar tracking, radar transmitters and receivers, and phased array radars; terrestrial wireless link design including line of sight, LMDS, and nonline of sight; optical link design including laser options, diffraction limits, lidar and communications links, tracking limitations, and GEO and LEO intersatellite link design; Wi-Fi link design; and directed energy systems.

Prerequisite(s): TCOM 551, TCOM 607, or permission of instructor.
TCOM 750 - Coordinating Seminar

Credits: 3 (NR)
Open only to students in MA or MS in telecommunications programs with at least 18 credits of course work prior to registration. Topics include specific telecommunications problems in management, law, engineering, education, and communications. Focuses on ways a problem in one area can create or solve a problem in other areas.

Prerequisite(s): Open only to students in the MA or MS in telecommunications programs with at least 18 credit hours of course work prior to registration.

Telecommunications (TELE)

Offered by the School of Public Policy

TELE 694 - Telecommunications Internship

Credits: 3-6 (RT)
Students work in approved professional-level telecommunications position, meeting regularly with agency and university internship supervisors. Paper and journal are required, as well as minimum 60 hours work for each credit of enrollment. Usually, students enroll in internships at end of program of study.

Prerequisite(s): Graduate standing, and permission of MA in telecommunications program director.

Grading: Graduate Special

TELE 730 - Telecommunications Management

Credits: 3 (NR)
Surveys strategic and organizational issues in field of telecommunications management. Focuses on strategic management; oriented toward executive management level of telecommunications firms.

Prerequisite(s): Graduate standing.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
**TELE 750 - Coordinating Seminar**

Credits: 3 (NR)
Topics include specific telecommunications problems in management, law, engineering, education, and communication. Focuses on ways a problem in one area can create or solve a problem in other areas.

**Prerequisite(s):** Open only to students in MA or MS in telecommunications programs with at least 18 credits of course work.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**TELE 798 - Directed Readings and Research**

Credits: 1-3 (NR)
Specialized course designed for students who seek to explore telecommunications topic in greater depth than through current course work provided in curriculum. Written report required; oral or written exam may also be required.

**Prerequisite(s):** Graduate standing in telecommunications, 15 graduate credits completed, and permission of department.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**TELE 799 - Thesis**

Credits: 1-6 (RD)
Individualized section form required. Original research related to student's concentration in telecommunications. Research must result in document meeting university standards.

**Prerequisite(s):** Degree candidacy in MA in telecommunications, completion of 24 credits of graduate course work, and approval of thesis proposal by faculty advisor and telecommunications director.

**Hours of Lecture or Seminar per week:** 1  
**Hours of Lab or Studio per week:** 0  
**Grading:** S/NC

**Theater (THR)**

Offered by the College of Visual and Performing Arts

**THR 101 - Theatrical Medium**

Credits: 3 (NR)
Introduces a broad spectrum of theatrical experiences, including the inside workings of production from page to stage, preparing students for an informed and lively engagement with the art in the contemporary world and an understanding of the nature of theater as a performing art. Involves attendance at theatrical productions and response to those experiences.
Fulfills general education requirement in arts.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### THR 150 - Drama, Stage, and Society I

Credits: 3 (NR)
Examines the development of Western drama and the collective art of theater from its beginnings through Shakespeare. Considers readings in dramatic literature and history of theater in social and cultural contexts.

Fulfills general education requirement in arts.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### THR 151 - Drama, Stage, and Society II

Credits: 3 (NR)
Brings study begun in THR 150 to present day. Considers readings in dramatic literature and history of theater in social context.

Fulfills general education requirement in arts.

**Hours of Lecture or Seminar per week:** 3
**Hours of Lab or Studio per week:** 0

### THR 190 - Special Topics

Credits: 1-3 (RT)
Rotating topic. Introductory seminar in areas of special interest.

**Notes:** May be repeated for maximum 12 credits.

**Hours of Lecture or Seminar per week:** 1-3
**Hours of Lab or Studio per week:** 0

### THR 191 - Practical Theater Seminar

Credits: 0 (RD)
Students 1) attend a Theater at Mason production, guest lecture or workshop, and 2) participate in a production load-in and 3) participate in a production strike. Theater majors must complete course each semester enrolled.

**Hours of Lecture or Seminar per week:** 3
THR 196 - Performance and Design Practicum

Credits: 1 (NR)
Academic credit awarded for satisfactory completion of a minimum of 30 hours of assignment on Theater at Mason productions including a presentation of portfolio documents demonstrating a practical analysis of the assignment to subject area mentors. Assignments include actor; designer; assistant designer; stage manager; and assistant stage manager. Successful completion of this course is required to earn a Theater degree. Restricted to Theater majors and minors with junior or senior status.

Notes: Successful completion of this course is required to earn a Theater degree.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only
When Offered: Fall, Spring.

THR 197 - Management/Literary Practicum

Credits: 1 (NR)
Academic credit awarded for satisfactory completion of a minimum of 30 hours of assignment on Theater at Mason productions including a presentation of portfolio documents demonstrating a practical analysis of the assignment to subject area mentors. Assignments include director; assistant director; dramaturg; master electrician; technical director; playwright; house manager; and publicity. Restricted to Theater majors and minors with junior or senior status.

Notes: Successful completion of this course is required to earn a Theater degree.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only
When Offered: Fall, Spring.

THR 198 - Theatrical Construction Practicum

Credits: 1 (NR)
Academic credit awarded for satisfactory completion of a minimum of 30 hours of assignment on Theater at Mason productions. Assignments include scenery construction and scene painting; costume construction; electrician; and props. Successful completion of this course is required to earn a Theater degree.

Notes: All freshman, first year transfers, and new Theater majors must register for one THR 198 credit during their first academic year as a Theater major.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
**THR 199 - Production Run Crew Practicum**

Credits: 1 (NR)
Academic credit awarded for satisfactory completion of a minimum of 30 hours of assignment on Theater at Mason productions. Assignments include stage crew; light board operator; sound board operator; wardrobe; and fly crew.

Notes: Successful completion of this course is required to earn a Theater degree.
All freshman, first year transfers, and new Theater majors must register for one THR 198 credit during their first academic year as a Theater major.

| Hours of Lecture or Seminar per week: | 1 |
| Hours of Lab or Studio per week:     | 0 |
| Grading:                            | Satisfactory/No credit only |
| When Offered:                       | Fall, Spring. |

**THR 200 - Play Production Practicum**

Credits: 1 (RT)
Academic credit is awarded for satisfactory completion of a minimum of 30 hours of assignment on Theater at Mason productions. Unless registered for a Theater course approved as directly connected to production (i.e. THR 196-199, 492, or 495) all students (including non-Theater majors) electing to participate in a Theater at Mason production must register for THR 200 concurrent with participation.

Notes: May be repeated for total of 8 credits.

| Hours of Lecture or Seminar per week: | 0 |
| Hours of Lab or Studio per week:     | 1 |
| Grading:                            | S/NC |
| When Offered:                       | Fall, Spring. |

**THR 201 - Stage Management**

Credits: 1 (NR)
Theory and technique of stage management for theater. Special emphasis on problem-solving skills.

| Hours of Lecture or Seminar per week: | 1 |
| Hours of Lab or Studio per week:     | 0 |

**THR 202 - Literary Management**
Principles of literary management and dramaturgy for regional/resident theater. Directed primarily toward developing new work.

**THR 203 - Production/Company Management**

Credits: 1 (NR)
Techniques of production and company management applied to university and professional theater productions.

**THR 210 - Acting I**

Credits: 3 (NR)
Promotes and develops a practical understanding of communication and performance theory by engaging and enhancing student's presentation skills. Students practice contemporary acting techniques in individual and group exercises, thus expanding awareness of human behavior, thought, and language. Involves attendance of theatrical productions and response to those experiences.

Fulfills general education requirement in arts.

**THR 230 - Introduction to Technical Theater**

Credits: 3 (NR)
Focuses on the physical production component of theater providing a foundation for the appreciation of the art whether as a member of the production crew or audience. Understanding modern technology and its historical context provides the framework for collaborative creative experiences. Involves hands-on participation in and attendance of theatrical productions.

Fulfills general education requirement in arts.

**THR 235 - Fundamentals of Costume Construction**

Credits: 3 (NR)
Basic flat pattern development, theatrical sewing techniques, and organization of the costume construction process. Includes lab study and practical experience in garment construction and related costume crafts as used in theater costume design.
Thr 300 - Voice and Speech I

Credits: 3 (NR)
For performers, presenters, and anyone wishing to improve their speaking voice. Basic techniques in breathing, vocal production, and articulation utilizing modern text and Linklater voice progression exercises to free the natural voice. Junior or senior status recommended.

Prerequisite(s): THR 210 or permission of instructor.

Thr 301 - Voice and Speech II

Credits: 3 (NR)
A continuation of voice and speech skills begun in THR 300 with the integration of Shakespearean text and performance. Advanced work in vocal production and phonetics.

Prerequisite(s): THR 300 or permission of instructor. Prerequisite enforced by registration system.

Thr 303 - Movement for the Actor I

Credits: 3 (NR)
Develops physical side of actor's instrument emphasizing free and responsive expression of impulse and intention.

Thr 304 - Movement for the Actor II

Credits: 3 (NR)
Advanced work in techniques established in THR 303.
THR 305 - Stage Combat

Credits: 3 (NR)
Studies safe, effective techniques for performing unarmed stage fights, falls, and rolls. Emphasizes acting the fight, safety, and storytelling.

Prerequisite(s): THR 210 and 310, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 310 - Acting II

Credits: 3 (NR)
Extends principles begun in THR 210 through scene study, audition technique, and work in analysis, characterization, and relationships.

Prerequisite(s): THR 210 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 313 - Event Technology

Credits: 3 (NR)
A theoretical and practical study of event technology. The course will include specifications, layout installation techniques and operation of sound systems, lighting systems and video systems for event industry sectors.

Prerequisite(s): THR 230 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall.

THR 314 - Lighting Stagecraft

Credits: 3 (NR)
Practical and theoretical instruction on becoming theatrical electrician. Includes ideas on workplace safety, basic electrical procedures, theatrical electrical production, integrating with other theater professionals, and professionalism.

Prerequisite(s): THR 230 or permission of instructor

Corequisite(s): Must be concurrently enrolled in THR 200
THR 315 - Sound Engineering

Credits: 3 (NR)
Theoretical and practical study of audio production for theater and the entertainment industry. Students will have the opportunity to apply course material to live productions.

Prerequisite(s): THR 230 or permission of instructor

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 320 - Beginning Modern Acting

Credits: 3 (NR)
Builds on existing skills in observation, sense memory, relaxation, and improvisation. Students learn variety of methods for scene preparation to apply to their own acting process.

Prerequisite(s): THR 210 and 310, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 321 - Acting Shakespeare

Credits: 3 (NR)
Develops understanding of challenges of performing Shakespeare by building on body of acting skills and knowledge. Focuses on how structure of language in plays reflects, reveals, and expresses character's emotional life. Students use detailed script analysis, expansion of vocal range, and use of actions and objectives to achieve experience of transforming Shakespeare's language into powerful theatrical expressions.

Prerequisite(s): THR 210 and 310, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 329 - Directing I

Credits: 3 (NR)
Introduces text analysis, rehearsal procedure, staging techniques, and development of production idea. Students direct exercises and short scenes, and prepare written production notes.
Prerequisite(s): THR 150-151, 210, or 350; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 330 - Seminar in Technical Theater

Credits: 3 (RT)
Offered periodically; addresses selected topic in design or technical theater on advanced level.

Prerequisite(s): THR 230 or permission of instructor. Rotating topic.

Notes: May be repeated for total 24 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 331 - Drafting and Model Making

Credits: 3 (NR)
Studies conventions and techniques of drafting and model making as methods of communication in the theatrical production process.

Prerequisite(s): THR 230 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 332 - Seminar in Costume History

Credits: 3 (NR)
Explores evolution of fashion and styles of dress. Students study silhouette, color, fabric, accessories, and make-up appropriate to development of clothing during specific historical era. Offers broader understanding of context relating to sociological and psychological factors influencing Western dress. Historical era studied will rotate.

Notes: May be repeated for total 9 credits if specific course content differs.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 333 - Stage Design

Credits: 3 (NR)
Fundamentals of creating, developing, and communicating design idea through sketches, plans, rendering, or models. Analysis of
text from designer's perspective.

Prerequisite(s): THR 230 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 334 - Lighting Design

Credits: 3 (NR)
Study of lighting design as art that defines space and reveals form. Introduces tools, equipment, and process of lighting design. Analyzes text from designer's perspective.

Prerequisite(s): THR 230.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 335 - Costume Design

Credits: 3 (NR)
Project-oriented class emphasizing process of designing and building. Costume design studied in relation to historical periods and artistic demands of script. Includes lecture, lab in fundamentals of costume design for stage.

Prerequisite(s): THR 230 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 336 - Advanced Theater Technology

Credits: 3 (NR)
Continuation of work begun in THR 230, stressing contributions of costumes, sound, and props to theatrical production. Intensive work in drafting for theater. Participation in theater division productions required.

Prerequisite(s): THR 230 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 337 - Sound Design

Credits: 3 (NR)
Project-oriented class explores theory and practice of sound design including history, technology, script analysis, and auditory
aesthetics.

**Prerequisite(s):** THR 230 or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### THR 339 - Theatrical Design Concepts

Credits: 3 (NR)  
Introduction to the principles of theatrical design. Course explores various design responsibilities and methods to create visual images for the stage through script analysis, research, and production team collaboration.

**Prerequisite(s):** THR 230 or permission of instructor

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### THR 340 - Directing II

Credits: 3 (NR)  
With techniques developed in THR 329, students analyze and stage extended scenes or one-act plays. Emphasizes collaborative process and production organization.

**Prerequisite(s):** THR 240 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### THR 342 - Makeup Design

Credits: 3 (NR)  
Project-oriented class emphasizing makeup for different performance spaces, character age analysis, facial anatomy, and specialized application for theater, opera, dance, film, and television.

**Prerequisite(s):** THR 230 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

### THR 343 - Costume Draping and Drafting

Credits: 3 (NR)  
Pattern development through draping and drafting. Laboratory study and practical experience in construction of stage costumes.
Prerequisite(s): THR 235 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 345 - Puppetry: History and Technique

Credits: 2-4 (NR)
In context of comprehensive and intensive exploration of world puppetry, course experiments with building and performance styles. Emphasizes hand and rod puppets, shadow work, toy theater, and bunraku-style figures. Students develop, build, and present original work.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 4

THR 350 - Script Analysis

Credits: 3 (NR)
Critical analysis of dramatic literature as preparation for production and performance. Examination of plot, character, theme, audience impact, and cultural context, and the transformation of intellectual ideas into physical theatrical production elements.

Fulfills writing intensive requirement in the major.

Notes: Writing intensive course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 351 - Dramatic Theory and Criticism

Credits: 3 (NR)
Chronological study of development of dramatic theory and criticism from Plato and Aristotle through modern movements. Students read plays, theoretical works, and critical responses, and write original criticism of performances or texts.

Prerequisite(s): THR 150 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 352 - Dramatic Literature Seminar

Credits: 3 (RT)
Rotating topic. Intensive study of particular topic, period, or genre in dramatic literature.
Notes: May be repeated for a total of 9 credits if specific course content differs.

**THR 355 - Moral Vision in American Theater**

Credits: 3 (NR)
Examines vision of American society created and presented in contemporary American theater. Subject defined as "moral" vision because focus is on how we perceive ourselves in relation to others and society's value standards. Perspectives include sociology, theory of culture, practical theater craft, and literary criticism. Features plays by range of American playwrights.

**THR 359 - World Stages**

Credits: 3 (NR)
Introduces variety of theatrical traditions and performance theories from around the world, with special emphasis on those not covered in introductory Western drama survey courses, 150 and 151. Students read and discuss dramatic texts, performance theory, and video clips to understand variety of theatrical traditions in cultural and historical contexts. Requirements include two team presentations (taking turns as writer and presenter), one midterm paper, and one solo presentation with accompanying paper.

Fulfills general education requirement in global understanding.

**THR 365 - Characterization**

Credits: 3 (NR)
Explores method and approach of understanding and creating characters for theater modeled on people from personal experience and observation, imagination, dreams, and other media. Transforms that information into detailed, specific, and vivid physical manifestations. Through presentations of characters drawn from personal experience, students shift understanding of characterization from "outward directed" physical adjustments to physical characteristics and personality character traits that are immediate, familiar, and completely realized from "inner driven" connections to their own lives.

**Prerequisite(s):** THR 210.

**THR 380 - Playwriting I**
Credits: 3 (RD)
Exposure to principles of dramatic writing, including character, plot, dramatic structure, dialogue, exposition, setting, and creating theatrical images using examples from plays, screenplays, and students' own work.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Fall.

THR 381 - Playwriting II

Credits: 3 (RD)
Intensive continuation of work begun in THR 380.

Prerequisite(s): THR 380 or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Spring

THR 382 - Screenplay Workshop

Credits: 3 (NR)
Studies screenwriting as dramatic form of 20th, 21st centuries. Explores story, plot structure, three act-structures, mythic structures, fundamental story patterns, character, thinking, and writing visually.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 395 - Theater as the Life of the Mind

Credits: 3 (NR)
Traces four subjects (battle of the sexes, good gifts, cyclical tragedy, and eschatology) from ancient theater to contemporary plays, television, and movies, using literary criticism, history, political theory, comparative religion, sociology, and anthropology.

Fulfills general education requirement in arts.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 405 - Advanced Stage Combat

Credits: 3 (RD)
Armed Stage Combat techniques are explored, unarmed techniques solidified, and advanced choreography mastered in this study of safe and effective theatrical storytelling through violence for Stage and Screen appropriate towards national certification as
Actor-Combatant.

**Prerequisite(s):** THR 305 or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Summer.

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**THR 410 - Screen Acting**

Credits: 3 (NR)  
Designed for students with a strong interest in pursuing a professional career in acting and is focused primarily on the particular techniques for screen acting in film and television.

**Prerequisite(s):** Junior status (60 credit hours completed) and successful completion of THR 310 or permission of instructor.

**Notes:** This class is restricted to Theater majors and minor only.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Spring  

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**THR 411 - Directing on Screen**

Credits: 3 (NR)  
Investigates directing for dramatic storytelling on screen in its historical and contemporary contexts and focuses on specific stages of creative development in movie-making. Students will be required to demonstrate their understanding in oral, written, and creative presentations.

Fulfills general education requirement in Arts.

**Prerequisite(s):** Sophomore standing (30 credit hours completed).

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**When Offered:** Fall

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**THR 412 - Performance on Screen**

Credits: 3 (NR)  
An examination of acting theories and practices associated with screen performances. Topics include evolution of acting theories and practices adapted from stage for screen, methods of analyzing screen performance, and understanding performance style and genre. Students will develop a more sophisticated appreciation for screen performance and be encouraged to demonstrate their understanding in oral, written, and performance presentations.

Fulfills general education requirement in Arts.
Prerequisite(s): Sophomore standing (30 credit hours completed).

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

THR 420 - Advanced Modern Acting

Credits: 3 (NR)
Advanced scene study to build on skills from previous acting courses. Students assigned actor's approach, midterm sonnet presentation, and final scene.

Prerequisite(s): THR 210 and 310, or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 421 - One-Person Show

Credits: 3 (NR)
Students work with designated faculty in creative writing, staging, and performance culminating in the successful writing, rehearsing, and performing of a one-person show.

Prerequisite(s): THR 210 and THR 310 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 423 - Audition Techniques: Stage and Camera

Credits: 3 (NR)
Professional directors, coaches, and casting directors offer perspectives on what makes an effective and honest audition. Students prepare a repertoire of pieces for stage and camera auditions.

Prerequisite(s): THR 310 or equivalent, or permission of instructor. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 424 - Contemporary Women Playwrights

Credits: 3 (RD)
Explores identity and culture, sexuality and gender, work, relationships, and power through the eyes of female dramatists and performance artists. Analyzes texts and issues through readings, video, and live performances.
**Prerequisite(s):** Junior standing, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**THR 425 - Verse Speaking**

Credits: 3 (NR)  
Explores verse literature and mechanics of verse structure through reading, discussing, and reciting major verse plays of Western drama from the Middle Ages through the 20th century. Focuses on various verse forms, paying particular attention to vocal clues within verse structure, the meaning of rhythm, and practicing vocal techniques used in speaking texts in class. Students also prepare weekly presentations of playwrights, and historical backgrounds of plays and their periods.

**Prerequisite(s):** THR 210 and 310, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**THR 434 - Advanced Lighting Design**

Credits: 3 (NR)  
In-depth study of lighting design. Work with lighting distribution, composition, and color to create compelling visual pictures and moods. Extensive work with script analysis as related to lighting, drafting of light plots, and the generating associated paper work used by lighting designer.

**Prerequisite(s):** THR 230 and 334, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**THR 440 - Advanced Studies in Directing/Dramaturgy**

Credits: 3 (NR)  
Examines theory and practice of collaborative development of production ideas by director and dramaturg teams. Students draw from extensive study in field to support production ideas from classical and modern repertoire to be presented as written and oral projects before faculty panel.

Fulfills general education requirement in synthesis.

**Prerequisite(s):** Junior or senior standing; completion of or concurrent enrollment in all general education courses; THR 150 or THR 151, and THR 329; or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0
THR 448 - Teaching Theater

Credits: 3 (RD)
Introduces and explores various theater teaching specialties. Examines philosophical, pedagogical, and practical issues in context of diverse teaching situations and venues that range from public school to undergraduate and graduate training to commercial establishments.

Prerequisite(s): Junior standing (60 credit hours completed) and Theater Teaching Concentration admission requirements or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

THR 449 - Elementary Theater Education

Credits: 3 (RD)
An in-depth exploration of teaching methods and classroom management for PK-6 theater education.

Prerequisite(s): Junior standing (60 credit hours completed) Theater Teaching Concentration admission requirements or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

THR 450 - Secondary Theater Education

Credits: 3 (NR)
This course explores teaching methods for theater that are appropriate for all students, including exceptional students, gifted and talented, and those with disabling conditions. It will cover requirements of the Virginia Theater Standards of learning, curriculum and instructional procedures for secondary grades 6-12 (both middle and secondary schools).

Prerequisite(s): Junior standing (60 credit hours completed) Theater Teaching Concentration admission requirements or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

THR 451 - Theater Pedagogy

Credits: 3 (NR)
This advanced exploration of teaching methods for K-6 enrichment programming includes classroom hours devoted to pedagogy and field study for practical application, leadership and administration for independent arts programming.
Prerequisite(s): Sophomore standing and enrollment in Theater Education concentration; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

THR 455 - Practical Teaching Experience

Credits: 3-6 (NR)
Full semester of supervised teaching experience in approved school programs PK-12. Credits based on number of teaching contact hours per week.

Prerequisite(s): Successful completion of Theater Teaching Concentration Coursework and students must pass the VCLA before student teaching (and the Praxis II (Theater: Content Knowledge) test during the internship semester).

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0
When Offered: Fall

THR 480 - Advanced Playwriting

Credits: 3 (RD)
Advanced playwriting workshop in which students explore their own voice in theatrical writing.

Prerequisite(s): THR 381, or permission of instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring.

THR 482 - Advanced Screenplay Workshop

Credits: 3 (RD)
Screenwriting workshop emphasizing student development in screenplay form, structure, and storytelling with emphasis on craft, character, and story culminating in a screenplay.

Fulfills writing intensive requirement in the major.

Prerequisite(s): THR 382 or ENGL 332/ENGH 372 or other writing preparation course as approved by the instructor.

Hours of Lecture or Seminar per week: 0
Hours of Lab or Studio per week: 3
When Offered: Fall, Spring.

THR 484 - Translation & Adaptation for Stage & Screen
This interdisciplinary course will introduce students to the arts of translation and adaptation for the stage and screen. Students will read examples of translations and adaptations, identify challenges in each, and discuss them with professionals who translate or adapt works for theater, film and/or opera. Students are also expected to apply their skills to one short and one long translation/adaptation project, and present their work to the class.

Prerequisite(s): Junior standing

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 490 - Special Topics in Drama

Credits: 1-6 (RT)
Rotating topic. Advanced seminar in topics of special interest, including dramatic writing or other media, and feminism in contemporary theater.

Notes: May be repeated for a total of 24 credits, provided specific course content differs.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

THR 491 - Major's Seminar on the Profession

Credits: 3 (NR)
Acquaints upper-division majors with realities of living and working in the theater. Features guest speakers from the profession and intensive development of students' portfolio materials specific to the demands of their field.

Prerequisite(s): Junior theater major.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 492 - Studio Project

Credits: 1-3 (RD)
Required for students assigned as director, designer, dramaturg, or stage manager for a Mason Players Studio production. Instruction and mentorship from appropriate Theater faculty to better develop the student's aesthetic. Required generation of portfolio material. This class is restricted to students participating in Studio productions within the academic year of the course offering.

Prerequisite(s): THR 329 and 340 or THR 333 or 334, or 335, or 337.

Notes: This class is restricted to Theater majors and minors only.

Hours of Lecture or Seminar per week: 3
THR 493 - Collaborative Lab Experience

Credits: 3 (NR)
Students will collaborate in a laboratory experience to create original material for the stage or screen. Course content will be project specific.

Prerequisite(s): Theatre major with junior standing (60 credit hours completed).

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit only
When Offered: Fall

THR 494 - Field Experience

Credits: 1-6 (RT)
Experience in a theatrical organization to provide opportunity to apply classroom training, knowledge, skills, and theory in a professional situation. Activity must be approved by department chair.

Prerequisite(s): Involves off-campus experience with a professional theater. Students must obtain permission of instructor prior to registering.

Notes: May be repeated for a total of 12 credits.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No credit only

THR 495 - Senior Capstone Project

Credits: 3 (RD)
Advanced-level project, with supervision of faculty advisor representing culmination of study in student's area of concentration. Examples include dramaturgy, design, playwriting, directing, acting, assistant directing, technical direction, and stage management. Project will include intellectual component and public presentation to a faculty panel demonstrating ability to communicate effectively in written, oral, and graphic forms as appropriate to the project.

Prerequisite(s): Junior standing or higher and declared concentration or permission of department chair.

Notes: Student must maintain a minimum grade of C or better to fulfill concentration requirements. May be repeated for a total of 6 credits provided course content is different.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
THR 496 - Text in Production

Credits: 3 (NR)
In-depth investigation of collaborative nature of theatrical arts. Examines discrete creative disciplines; acting, directing, dramaturgy, and design as discussed by distinguished professionals and scholars. In-depth exploration of one selected playscript for the entire semester. Students will work collaboratively in small groups to research, design, direct, and perform scenes from selected text.

Fulfills general education requirement in synthesis.

Prerequisite(s): Completion or concurrent enrollment in all theater core courses and all other required general education courses, and junior standing; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 497 - Independent Study

Credits: 1-6 (RT)
Individual research and creative project in close consultation with instructor. Selection from projects in performance, directing, technical theater and design, playwriting, or theater history and criticism.

Prerequisite(s): Open only to theater majors with 90 credits and special permission of department chair

Notes: May be repeated for a total of 24 credits, provided suffix citing specific course content is different

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

THR 548 - Theater Teaching Foundations

Credits: 3 (RD)
Explores various theater teaching specialties in venues that range from public school to undergraduate and graduate training to commercial establishments.

Prerequisite(s): Graduate standing, eligibility for post-baccalaureate certificate in Theater Education or permission of the instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

THR 549 - Advanced Elementary Theater Ed
An in-depth exploration of teaching methods and classroom management for PK-6 theater education combined with advanced managerial skill training.

**Prerequisite(s):** Graduate standing, eligibility for post-baccalaureate in Theater Education Licensure, or permission of the instructor.

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0
- **When Offered:** Spring

**THR 550 - Advanced Secondary Education**

Credits: 3 (NR)

This course explores teaching methods for theater that are appropriate for all students, including exceptional students, including gifted and talented and those with disabling conditions. It will cover requirements of the *Virginia Theater Standards of Learning*, curriculum and instructional procedures, as well as theater classroom management, for secondary grades 6-12 (both middle and secondary schools).

**Prerequisite(s):** Graduate standing, eligibility for post-baccalaureate certificate in Theater Education, or permission of the instructor.

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0
- **When Offered:** Fall

**THR 551 - Advanced Theater Pedagogy**

Credits: 3 (NR)

Advanced concepts in teaching methods for K-6 enrichment programming based on further exploration of multiple intelligences, including classroom pedagogy and field study for practical application of curriculum and administrative skills.

**Prerequisite(s):** Graduate standing, eligibility for post-baccalaureate certificate in Theater Education or permission of the instructor.

**Notes:** Graduate standing, eligibility for post-baccalaureate certificate in Theater Education or permission of the instructor.

- **Hours of Lecture or Seminar per week:** 3
- **Hours of Lab or Studio per week:** 0
- **When Offered:** Spring

**THR 555 - Practical Teaching Experience**

Credits: 3-6 (NR)

Full semester of supervised teaching experience in approved school programs PK-12. Credits based on number of teaching contact hours per week.
Prerequisite(s): Graduate standing, eligibility for post-baccalaureate certificate in Theater Education, or permission of instructor.

Hours of Lecture or Seminar per week: 3-6
Hours of Lab or Studio per week: 0
When Offered: Fall

THR 571 - Advanced Playwriting Workshop

Credits: 3 (NR)
Advanced playwriting workshop in which students explore their own voice in theatrical writing.

Prerequisite(s): Undergraduate degree or equivalent, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

THR 599 - Independent Study

Credits: 1-6 (RT)
Independent reading, performance, or research on a specific project under direction of selected faculty member. May include attendance in a parallel undergraduate course.

Prerequisite(s): Undergraduate degree or equivalent, or permission of instructor.

Notes: May be repeated for a total of 6 credits.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

Tourism and Events Management (TOUR)

Offered by the College of Education and Human Development

TOUR 110 - Professionalism and Civility

Credits: 1 (NR)
Focuses on developing competencies in the areas of professionalism and civility in a variety of settings including professional image, conduct at work, telephone, written, oral, and electronic etiquette, table manners, and social networking with an emphasis on the cultural needs for honoring commitments and obligation.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0
**TOUR 190 - Wedding Planning**

Credits: 3 (NR)
Introduction to the planning and management of weddings. Explores social, political, economic, cultural, religious, and historical influences on wedding planning decision-making and business strategies. Reviews practices relevant to successful wedding planning, and consultancy for diverse clients and settings.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TOUR 200 - Introduction to Travel and Tourism**

Credits: 3 (NR)
Introduction to travel and tourism from local to international levels. Overview of the scale, scope, and organization of the industry, with emphasis on the development of natural, cultural, heritage, and recreational resources of tourism. Identifies issues related to the economic, technological, legal, and political aspects of tourism.

Notes: Open to nonmajors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TOUR 210 - Global Understanding through Travel and Tourism**

Credits: 3 (NR)
Examines tourism as a global industry and human activity that promotes and facilitates understanding of historical and cultural values, and of international institutions that characterize the broader global system.

Fulfills general education requirement in global understanding.

Notes: Open to nonmajors.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TOUR 220 - Introduction to Event Management**

Credits: 3 (NR)
Explores principles and practices of managing medium- and large scale events including festivals, conventions, concerts, shows, sporting events, and ceremonies. Emphasizes organization, site preparation, communications, personnel, and security as well as evaluation and innovation.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
TOUR 221 - Event Implementation and Evaluation

Credits: 3 (NR)
Introduction to event implementation and evaluation through involvement in on-site event delivery and analysis. Studies participant motivation and economic, social, environmental, and cultural impacts in relation to an event's products and services.

Prerequisite(s): TOUR 220 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TOUR 230 - Introduction to Hospitality Management

Credits: 3 (NR)
This course is an introduction to hospitality management, including an overview of management in the hospitality industry and professional opportunities. The concepts and practices of hospitality management are examined and discussed. The scope and forms of hospitality organizations are reviewed, as well as trends within these organizations.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TOUR 241 - Practicum

Credits: 3 (NR)
Provides 120 hours of supervised professional experience in an approved tourism or event management setting under the supervision of a practicum University Supervisor and Agency Supervisor.

Prerequisite(s): TOUR 200, TOUR 220, sophomore standing, and TOUR major status. Prerequisite enforced by registration system.

Notes: TEM majors only

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 3
Grading: Satisfactory/No Credit

TOUR 301 - Hotel Management

Credits: 3 (NR)
Explores interrelated systems in hotel management, including front desk, reservations, housekeeping, food/beverage, telecommunications, guest services and security. Reviews and segments hotel products and associated management challenges.

Prerequisite(s): TOUR 230. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
TOUR 310 - Food and Beverage Management

Credits: 3 (NR)
Explores the principles of foodservice management regarding production and selling of food and beverage products. Categorizes various types of food, wine, beer and spirits. Reviews foodservice buying, pricing, menu planning, production, storage, service, controls and quality assurance.

Prerequisite(s): TOUR 230. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

TOUR 311 - Women and Tourism

Credits: 3 (NR)
Open to nonmajors. Approved general education requirement. Focuses on women as hosts and guests. Using social theory, explores issues regarding the history and evolution of tourism as a gendered system. Addresses family, solo and business travel, and employment, taking into consideration issues related to more and lesser developed countries as they relate to the roles of women in international tourism.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TOUR 312 - Ecotourism

Credits: 3 (NR)

Analyzes tourism that is nature-based and entails a learning component while striving for environmental and sociocultural sustainability within the context of financial viability. Considers markets, role of protected areas, impacts, business aspects, external environments, organizations and policies, and research trends and needs. Designated a Green Leaf Course.

Prerequisite(s): TOUR 200 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TOUR 313 - Event Technology
Credits: 3 (NR)
Explores theoretical and practical considerations of event technology. Examines specifications, layout installation techniques and operation of sound systems, lighting systems and video systems for event industry sectors.

Prerequisite(s): TOUR 220. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

TOUR 320 - Hospitality Management Information Systems

Credits: 3 (NR)
Introduces management information systems (MIS) technology and its application to hospitality sectors from managerial and strategic perspectives. Surveys computer applications, products and trends in gathering, analyzing, storing and communicating information within hospitality sectors.

Prerequisite(s): TOUR 230. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

TOUR 330 - Resort Management

Credits: 3 (NR)
Surveys effective practices in the management of resort recreation enterprises. Examines basic resort operations, including front desk, food and beverage, amenities, and housekeeping. Covers management of a variety of resort types, such as ski resorts, beach resorts, dude ranches, business retreats, adventure camps, health spas, and golf resorts.

Prerequisite(s): TOUR 200 and TOUR 220 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TOUR 340 - Sustainable Tourism

Credits: 3 (NR)
Considers the characteristics of environmentally, economically, and socioculturally sustainable tourism, and assesses the possibilities and limitations for its implementation in a variety of destination and product settings. Emphasizes conventional "mass" tourism as well as small-scale "alternative" tourism.
Designated a Green Leaf Course.

Prerequisite(s): TOUR 200 and TOUR 220 Prerequisite enforced by registration system.
TOUR 352 - Heritage and Cultural Tourism

Credits: 3 (NR)
Analyzes historical and cultural attractions, including museums, canals, monuments, pilgrimage sites, military sites, and cultural and heritage landscapes. Covers presentation and interpretation, African-American and Native American heritage, management and operational considerations, and marketing.

Prerequisite(s): TOUR 200 and TOUR 220 Prerequisite enforced by registration system.

TOUR 362 - Cultural and Environmental Interpretation

Credits: 3 (NR)
Focuses on communication processes and practices used by professionals to explain and interpret special characteristics of cultural and environmental resource sites for visitors. Discusses conceptual principles for planning interpretive programs, as well as techniques for analyzing and disseminating information and entertainment through various media. Examines delivery of interpretive messages across a variety of audiences, strategies for programming interpretive services, and the administration and evaluation of interpretive services at tourism, event, and recreation sites.

Prerequisite(s): PRLS 300, or PRLS 328, or TOUR 352

TOUR 412 - Tourism and Events Marketing

Credits: 3 (NR)
Provides understanding and tools for marketing and management of financial resources in entrepreneurial tourism enterprises. Includes market planning, business planning, feasibility assessment, investment analysis, basic accounting, and operational control.

Prerequisite(s): TOUR 200, TOUR 220, PRLS 310, and PRLS 410 Prerequisite enforced by registration system.

TOUR 414 - Tourism and Events Finance
Develops skills and competencies for the management of financial resources in tourism and events management enterprises. Students learn about business planning, feasibility assessment, investment analysis, and basic accounting and operational control, with special emphasis on application to this unique industry.

Prerequisite(s): TOUR 200, TOUR 220, PRLS 310, and PRLS 410 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TOUR 416 - Hospitality Sales

Credits: 3 (NR)
Explores the principles of personal selling within hospitality sectors. Reviews the nature of buyers and sellers, situational selling, the sales process and relationship management.

Prerequisite(s): TOUR 230, PRLS 410. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Fall

TOUR 418 - Hospitality Accounting

Credits: 3 (NR)
Reviews concepts and methods related to the collection, processing, and interpretation of accounting data for managerial planning, control and evaluation as applied to hospitality enterprises.

Prerequisite(s): TOUR 230, PRLS 410. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

TOUR 420 - Tourism Planning/Policy

Credits: 3 (NR)

Principles of planning and policy that apply to integrated and sustainable tourism development at the international, national, state, regional, local, and site scale. Considers government, industry, and community perspectives. Designated a Green Leaf Course.

Prerequisite(s): PRLS 310 and TOUR 340 Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
TOUR 440 - Meetings and Conventions

Credits: 3 (NR)
Analyzes meetings, incentives, conventions, and exhibitions with respect to business environment and structure, industry suppliers, site and facility selection, human resource management, legal and financial issues, marketing and promotion, and event organization.

Prerequisite(s): TOUR 220 and PRLS 310. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

TOUR 450 - Hospitality Human Resources Management

Credits: 3 (NR)
Reviews concepts and methods related to the achievement of strategic business goals through employee recruitment, training and development.

Prerequisite(s): PRLS 410. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

TOUR 460 - Hospitality Facilities Operations

Credits: 3 (NR)
Explores the principles applied to facilities systems operations in hospitality sectors. Considers design, planning, layout and maintenance of hospitality properties and systems.

Prerequisite(s): TOUR 340. Prerequisite enforced by registration system.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
When Offered: Spring

TOUR 470 - Senior Seminar

Credits: 1 (NR)
Capstone educational experience focuses on current issues in tourism and event management, and career development strategies.

Prerequisite(s): TOUR 241, TOUR 340 and PRLS 410. Prerequisite enforced by registration system.

Notes: Only for TEM majors with senior status.
TOUR 480 - Special Topics

Credits: 1-3 (RD)
Selected topics reflect interest in specialized area of tourism and events management. Announced in advance.

Prerequisite(s): 60 credits

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

TOUR 490 - Internship

Credits: 12 (NR)
Supervised professional experience provides a continuous and structured opportunity to apply principles and skills developed in the classroom to the solution of practical problems in the tourism and events management industry. Provides a paid or voluntary full-time work experience in an approved tourism or event management setting for a minimum of 10 to 12 weeks. Includes meetings and assignments before and during the internship.

Prerequisite(s): Open to majors only. 90 credits, TOUR 241, TOUR 340 and PRLS 410. Prerequisite enforced by registration system.

Notes: Open only to majors.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 12
Grading: Satisfactory/No Credit

TOUR 499 - Independent Study

Credits: 1-3 (NR)
Faculty directed independent study of approved topics in tourism and events management.

Prerequisite(s): TOUR 200 and 220, and 90 credits

Notes: TEM majors only.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

TOUR 540 - Sustainable Tourism Management
Examines components and interrelationships within tourism systems and assesses the potential economic, sociocultural, and environmental impacts associated with this sector. Considers managerial strategies that minimize the negative impacts and maximize the positive impacts, thereby attaining sustainable tourism. Designated a Green Leaf Course.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TOUR 710 - Advanced Administrative Practices in Tourism and Events**

Credits: 3 (NR)
Explores best practices in the administration of tourism and events businesses. Particular emphasis will be placed on contract management, and strategic planning for dynamic markets and changing technologies, with specific applications to geographically dispersed consumers and suppliers.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TOUR 712 - Marketing Tourism and Event Planning Services**

Credits: 3 (NR)
Focuses on the unique challenges and opportunities faced by tourism and event marketers in producing, delivering, pricing, and promoting tourism and event services.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**TOUR 720 - Major Events and Convention Management**

Credits: 3 (NR)
Prepares graduate students for managing large scale events such as major festivals, conventions, sporting contests, cultural exhibitions, and commercial exhibitions. Management of human financial, information, and technology resources will be emphasized.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

**Turkish (TURK)**
TURK 110 - Elementary Turkish

Credits: 6 (NR)
Introduces elements of grammar, vocabulary, oral skills, listening comprehension, and reading.

Hours of Lecture or Seminar per week: 6
Hours of Lab or Studio per week: 0

TURK 210 - Intermediate Turkish

Credits: 3 (NR)
Continuation of the development of basic components of the language, with focus on listening, speaking, reading, and writing skills. Introduces students to the cultures and histories of Turkish-speaking regions.

Prerequisite(s): TURK 110, appropriate placement score, or permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

University/Interdisciplinary Studies (UNIV)

Offered by the University

UNIV 101 - Freshman Academic Transition

Credits: 1-2 (RD)
This seminar focuses on academic transition and development issues for second semester freshmen. A special emphasis is placed on resources and techniques to assist students with assessing and improving their academic performance. Students will work closely with their instructor to track their academic progress over the course of the semester.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

UNIV 190 - Freshman Seminar

Credits: 3 (RT)
Broad interdisciplinary subjects taught by Robinson Professors; topics vary.

Prerequisite(s): Freshman standing, minimum 3.3 cumulative GPA or permission of instructor.

Notes: Courses may be repeated for up to 12 credits.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0
UNIV 301 - Great Ideas in Science

Credits: 3 (NR)
Nontechnical introduction to ideas that have shaped the growth of science, from the building of Stonehenge to modern theories of the Big Bang. The idea behind each major advance is treated in its historical context, with special attention to its importance in mankind's understanding of the nature of the universe. Intended for nonscience majors; uses little mathematics.

Fulfills general education requirement in natural science (nonlab).

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

UNIV 391 - Students as Scholars Scholarly Inquiry

Credits: 0-9 (RD)
Students contribute to scholarly, research, or creative projects by engaging in the recursive process of scholarly inquiry as preparation for participation in an individualized original project. Students will hold regular meetings with their project mentor, and make satisfactory contributions to the project.

Notes: Enrollment only with permission from OSCAR.

Hours of Lecture or Seminar per week: 0-9
Hours of Lab or Studio per week: 0
Grading: Satisfactory/No Credit
When Offered: Fall, Spring.

UNIV 442 - Krasnow Seminar

Credits: 3 (NR)
Interdisciplinary seminar offering a window on the latest advances and research related to cognitive science, an interdisciplinary field of inquiry that seeks to understand the nature, basis, and origins of human consciousness, thinking, and cognition.

Fulfills general education requirement in synthesis.

Prerequisite(s): ENGL 302/ENGH 302, COMM 100, 101, or 104, completion of or concurrent enrollment in all other required general education courses, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

UNIV 491 - RS: Students as Scholars Individualized Scholarly Experience

Credits: 0-9 (RD)
Students actively participate in the process of scholarship and make a significant contribution to the creation of scholarly.
research, or creative project. Students will meet regularly with their project mentor, make satisfactory progress towards the completion of the project, and create a disciplinary product for evaluation.

Notes: Enrollment only with permission from OSCAR.

**Hours of Lecture or Seminar per week:** 0-9  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit  
**When Offered:** Fall, Spring.

### UNIV 495 - RS: Undergraduate Research Scholars Program Seminar

Credits: 3 (NR)  
Students accepted into Undergraduate Research Scholars Program participate in a weekly seminar, hold regular meetings with mentor, and make satisfactory progress on their research or creative project. At the end of the semester, students either complete their project and present the results in a professional context, or apply for continuation through UNIV 496. See oscar.gmu.edu for more information and application.

Notes: Enrollment only with acceptance into the URSP through OSCAR.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No Credit  
**When Offered:** Fall, Spring.

### UNIV 496 - RS: Undergraduate Research Scholars Program Continuation

Credits: 0 (RD)  
Students continuing their participation in the Undergraduate Research Scholars Program hold regular meetings with mentor and make satisfactory progress on their research or creative project. At the end of the semester, either complete their project and present the results in a professional context, or apply for continuation. See oscar.gmu.edu for more information and application.

Prerequisite(s): UNIV 495.

Notes: Enrollment only with acceptance into the URSP through OSCAR.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 9  
**Grading:** Satisfactory/No Credit  
**When Offered:** Fall, Spring.

### University Transition
UNIV 100 - Freshman Transition

Credits: 1-2 (NR)
Helps freshmen transition to college life, focusing on adjusting academically, developing decision-making skills, and learning about services and opportunities for involvement. Although all classes have a core body of knowledge, each class specializes in a particular aspect of college life. Team development at Hemlock Overlook is a component of most sections.

Prerequisite(s): Freshman standing. An outdoor team development event is a component of every UNIV 100 section.

Hours of Lecture or Seminar per week: 1-2
Hours of Lab or Studio per week: 0

UNIV 200 - Sophomore Transition

Credits: 1-2 (NR)
Focuses on transition issues for students at second-semester freshman standing or higher. Main focus is career exploration and choosing a major. Section topics include self-assessment, values clarification, skill development, career and major research, and options for experiential learning.

Prerequisite(s): UNIV 100 or sophomore through junior standing. Students who miss more than the first class meeting of any UNIV 200 section will not be allowed to enroll.

Hours of Lecture or Seminar per week: 2
Hours of Lab or Studio per week: 0

UNIV 300 - University: Junior Transition

Credits: 1-2 (RT)
Focuses on transition issues for students at second-semester sophomore standing or higher. Features three tracks: assisting new transfer students with first-semester academic and transition issues, career readiness for internships and research assistantships, and peer leadership.

Hours of Lecture or Seminar per week: 1
Hours of Lab or Studio per week: 0

UNIV 400 - Senior Transition

Credits: 1-2 (RD)
Transition issues for students at second-semester junior standing or higher. Focuses on development for the professional workplace, skills for graduate school preparation, and readiness for life responsibilities. Includes skill preparation for work, development of field-of-study expertise, resume and portfolio development, job-search strategies, money management, career and alumni networks, interview strategies, and final year planning.

Prerequisite(s): Second semester junior standing or higher.
Urban and Suburban Studies (USST)

Offered by the College of Humanities and Social Sciences

**USST 301 - Urban Growth in a Shrinking World**

Credits: 3 (NR)

Examines process of urbanization historically and comparatively. For major world regions, attention is given to the political economy of urbanization and its impact on social and economic relations. Examines growing globalization of the world economy, implications for urban life, and urban political economy of the future. Designated a Green Leaf Course.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**USST 390 - Special Topics in Urban and Suburban Studies**

Credits: 3 (NR)  
Subject varies according to specialization of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**USST 401 - Seminar: The Future of Metropolitan America**

Credits: 3 (NR)  
Examines trends in the development of American metropolis, including impact of information economy and technological developments on metropolitan form and life, continuing outward growth and increasing decentralization of metropolitan areas, changing functional organization of urban space, and continued social segregation in metropolitan areas. Analyzes contemporary predictions about future of metropolitan life in America, and explores how alternative public policies can shape that future. Students work on research projects in metro area.

**Prerequisite(s):** 12 credits of USST-approved courses, including USST 301.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**USST 490 - Internship**
Approved work-study programs that focus on urban and suburban issues with an approved agency or firm. Placement depends on student qualifications and availability of positions. Students work with onsite supervisor and coordinator of urban and suburban studies.

Prerequisite(s): Open only to students with 12 credits of USST; see USST coordinator

Women and Gender Studies (WMST)

Offered by the College of Humanities and Social Sciences

WMST 100 - Representations of Women

Credits: 3 (NR)
Explores ways women are portrayed in advertising, television, film, photographs, cartoons, performance arts, literature, religious texts, and news media from various worldwide sources. Through interdisciplinary study students will evaluate the powerful effects these representations have on the political, economic, and social lives of women throughout the world.

Fulfills general education requirement in global understanding.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 200 - Introduction to Women and Gender Studies

Credits: 3 (NR)
Interdisciplinary introduction to women's studies, encompassing key concepts in the field, history of women's movements and women's studies in America, cross-cultural constructions of gender, and a thematic emphasis on the diversity of women's experience across class, race, and cultural lines.

Fulfills general education requirement in social and behavioral science.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 300 - Current Issues in Women and Gender Studies

Credits: 1-6 (RT)
Study of selected topics central to contemporary women and gender studies. Topics vary but include subjects such as women and violence, women and international development, women's myth and ritual, LGBTQ topics, the history and politics of sexuality, psychoanalysis, and religion.
Notes: May be repeated for credit when topic is different.

Hours of Lecture or Seminar per week: 1-6
Hours of Lab or Studio per week: 0

WMST 301 - Sex and Gender in Contemporary Society

Credits: 3 (NR)
Changing conceptions of sex roles, both female and male, in contemporary society. Using historical and comparative data, course considers the differential socialization of males and females in relation to the changing social structure in which it takes place.

Prerequisite(s): 60 credits, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 302 - Cultural Constructions of Sexualities

Credits: 3 (NR)
Introductory survey of cultural, literary, and theoretical constructions of sexuality that seeks to complicate traditionally fixed categories of identity. Examination of various representatives of human sexuality, with particular attention to its intersections with gender, race, ethnicity, nationality, and class.

Equivalent to ENGH 418

Prerequisite(s): 6 credits of 200-level English courses.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 303 - Psychology of Women

Credits: 3 (NR)
Behavior and attitudes of women, influence of sex chromosomes and sex hormones on behavior, influence of culture on sex role differentiation, and theories of sex role development.

Prerequisite(s): PSYC 100, and BIOL 103 and 104; or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 304 - Women and Media
Credits: 3 (NR)
Introduction to the concepts of the power and influence of the mass media. Allows students to see themselves as products of media influence and gives them a sense of women's roles as media professionals, as well as consumers.

Prerequisite(s): COMM 302 or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 305 - Women and Literature

Credits: 3 (RD)
An exploration of the experience of women as both authors of and subjects in imaginative literature.

Equivalent to ENGH 310

Prerequisite(s): 6 credits of 200-level English courses.

Notes: May be repeated once for credit when subtitle is different, with permission of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 306 - Topics in Communication and Gender

Credits: 3 (RD)
Exploration of selected topics involving gender and communication. Topics may include women in media, women as rhetors, male/female communication, and communication and sex roles. Specific interests are examined in a seminar setting.

Prerequisite(s): 60 credits.

Notes: Course may be repeated with approval of department.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 307 - Women and Work

Credits: 3 (NR)
Historical and contemporary accounts of women's participation in paid and unpaid labor. Analyzes the nature of women's work through the divisions in the labor market due to gender, race, nationality, ethnicity, and class. Provides a detailed look at occupational sex segregation, sexual harassment, the glass ceiling, and the role of religion, culture, and education in determining women's opportunities and their value as workers and as family providers.

Prerequisite(s): 30 credits.
WMST 308 - Introduction to Lesbian, Gay, Bisexual, Transgender, Transsexual, and Queer Studies

Credits: 3 (NR)
Explores major events in lesbian, gay, bisexual, transgender, transsexual, and queer culture and history in the United States and throughout the world to understand how identities, experiences, and movements have been socially constructed and have changed in different times and places, often as a result of race, class, and gender inequities.

WMST 309 - Black Social Movements: Gendering of Violence and Activism

Credits: 3 (NR)
Examines racialized gendered conceptions of popular culture, violence, and the legal system and their role in structuring systems of segregation, discrimination and exclusion. Looks at the gendered strategies and conflicts of organizations that arose to combat racial violence and overturn legal and social barriers to equal opportunity and citizenship rights.

WMST 310 - Women, Sex, and Psyche

Credits: 3 (NR)
Explores the changing concepts of women's psychology, sexuality, and relationships in different social and cultural contexts. Demonstrates the ways women's "psychological self" has been the source of humor, malignment and curiosity throughout history. Discussion-based classroom explores the intersections of self, race, gender and relationship.

WMST 311 - The Erotic and the Sacred

Credits: 3 (NR)
Explores the complex relationship between the body, sexuality and the spirit. Investigates sacred texts, novels, short stories, poetry and film that engage with a variety of cultural embodiments of sexualities and of the sacred, international in scope. Teaches students to formulate critical perspectives at the intersection of the erotic and sacred.
**WMST 312 - Gender, Trauma, and Recovery**

Credits: 3 (NR)
Explores the experience of emotional trauma, the process of recovery and the etiology of healing in contemporary North American culture. Investigates memoir, poetry, film, and novel as case studies of trauma and examines the effect of gender on traumatic experiences. Applies psychological and feminist theoretical perspectives.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**WMST 313 - Women Who Kill**

Credits: 3 (NR)
Questions the assumptions that women are nonviolent by nature and commit acts of violence only in response to abuse. Explores the complexity of human interactions through popular culture, literature and film and through theoretical works that attempt to explain female violence (compared to male violence) and as it is seen by others.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**WMST 314 - Stories of Gender and Human Rights**

Credits: 3 (NR)
Examines global human rights issues through memoir, poetry and fiction. Explores the ways women use literary expression to voice their dissent and to struggle against human rights violations.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**WMST 315 - Women During the Enslavement Era**

Credits: 3 (NR)
Examines the general experiences of enslaved women and nominally free women. Includes the lives of female reformers involved in the public arena as orators, writers, preachers, abolitionists and women's rights activists. Explores the effect of gender, class, and race on the development of ideologies concerning abolition, colonization, women's rights, and enslavement.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

**WMST 316 - Gendered Pan-Africanism**
Gendered Pan-Africanism. Explores the writings and activism of African Americans who traveled to Africa in search of a shared cultural past and present or an opportunity to build pan-African allegiances. Examines these encounters within the context of the Cold War, US civil rights and African anti-colonial movements, and racial and gender ideologies of the time.

**WMST 330 - Theoretical Perspectives in Women and Gender Studies**

Credits: 3 (NR)
Examination of feminist and queer critiques and transformations of the theories, methods, and methodologies of the sciences and humanities.

Prerequisite(s): WMST 200, or permission of instructor.

**WMST 390 - Study Abroad**

Credits: 1-3 (NR)
Study abroad under supervision of George Mason University faculty. Course topics, content and locations vary.

**WMST 400 - Internship in Women and Gender Studies**

Credits: 1-3 (RD)
Community- or campus-based service or experiential learning related to women's or gender issues. Independent course in which students develop, in consultation with a faculty member, individual contracts defining the learning and competencies they plan to gain from the experience. Includes a paper and/or portfolio component.

Prerequisite(s): Completion of 60 credits, including WMST 200, or permission of instructor.

Notes: May be repeated for credit, up to 6 credits.

**WMST 401 - Experiential Learning in Women and Gender Studies**
Credits: 1-3 (RD)
Community- or campus-based service or experiential learning as it relates to a specific WMST course, taken at the same time. Students develop, in consultation with faculty member, individual contracts defining learning and competencies they plan to gain from the experience.

Prerequisite(s): Concurrent enrollment in women and gender studies course and approval of advisor and instructor.

Notes: May be repeated for credit up to total 6 credits, but only 3 credits of WMST 400 or 401 may be applied toward the women and gender studies interdisciplinary minor.

Hours of Lecture or Seminar per week: 1-3
Hours of Lab or Studio per week: 0

WMST 402 - Queer Theory

Credits: 3 (NR)
Challenges rigid categories and definitions in order to create a space for marginalized voices. Examines the inconsistencies and erasures that often characterize notions of sex, gender, sexuality, and sexual desire. Explores categories that intersect with sexualized identities such as race, ethnicity, class, nationality, location, and age.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 410 - Feminist Approaches to Social Research

Credits: 3 (NR)
Introduction to feminist approaches to social research for advanced undergraduate students. Students learn the techniques for collecting, analyzing, and writing-up research data as they examine many of the central methodological issues and questions raised by feminist scholars undertaking social research. Because an understanding of how to conduct social research is best gained through experience in the social world, this course emphasizes a learning-by-doing approach.

Prerequisite(s): 60 credits, including 9 credits of WMST course work, or permission of instructor.

Hours of Lecture or Seminar per week: 3
Hours of Lab or Studio per week: 0

WMST 411 - Gender Research Project

Credits: 3 (NR)
Students work as part of a research team and undertake a semester-long project investigating the significance of gender to the social and academic life of students at Mason. Enhances understanding of techniques for collecting, analyzing, and writing up empirical material. Involves in-depth investigation of and critical engagement with ethical, interpretive, and representational considerations relating to feminist research.

Prerequisite(s): WMST 410 or permission of instructor.
WMST 427 - Feminist Political Thought

Credits: 3 (NR)
Explores feminist political thought in historical context. Topics include feminist political movements, feminist critiques of political philosophy, and feminist contributions to political theory.

Prerequisite(s): GOVT 101, WMST 200, 3 credits of philosophy, or permission of instructor.

WMST 490 - Independent Study in Women and Gender Studies

Credits: 1-3 (RD)
Reading or research on a specific topic related to women and/or gender issues, under the direction of a faculty member. May involve a combination of reading assignments, tutorials, papers, presentations, or off-campus activities.

Prerequisite(s): 9 WMST credits including WMST 200, or permission of instructor.

Notes: May be repeated for credit up to a total of 6 credits.

WMST 600 - Special Topics

Credits: 3 (RT)
Study of selected topics central to contemporary women and gender studies. Topics vary but include representation and images, violence, public policy, international development, transmigration of labor, myth and ritual, history and politics of sexuality, psychoanalysis, and religion.

Notes: May be repeated for credit when topic is different.

WMST 610 - Feminist Approaches to Social Research

Credits: 3 (NR)
Provides an introduction to feminist approaches to social research. Students collect, analyze, and write-up research data as they examine many of the central methodological issues and questions raised by feminist scholars. These include feminist critiques of
positivism, feminist standpoint theory, social action research models, and feminist engagements with ethical concerns in doing research with human subjects. Emphasizes a learning-by-doing approach to prepare students to conduct research.

**Prerequisite(s):** Graduate standing and 3 credits of 600-level WMST course work, or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**WMST 611 - Gender Research Project**

Credits: 3 (NR)  
Students work as part of a research team and undertake a semester-long project investigating the significance of gender to the social and academic life of students at Mason. Enhances understanding of techniques for collecting, analyzing, and writing up empirical material. Involves in-depth investigation of and critical engagement with ethical, interpretive, and representational considerations relating to feminist research.

**Prerequisite(s):** WMST 610 or SOCI 634.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**WMST 630 - Feminist Theories across the Disciplines**

Credits: 3 (NR)  
Multidisciplinary course examines the central issues of feminist theory and explores the various strategies of feminist theorists. Analyzes the ways in which feminist theories have challenged established disciplinary boundaries and contested the traditional assumptions of the humanities, the social sciences, and the sciences.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**WMST 640 - Women and Global Issues**

Credits: 3 (NR)  
Multidisciplinary course explores the complex issues women face in different regions of the world. Addresses women's diverse and shared global concerns and provides students with the tools to analyze and understand women in a global context.

**Prerequisite(s):** Graduate standing.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**WMST 690 - Directed Readings and Research in Women and Gender Studies**
Advanced individualized study of gender through readings, discussion, research, and/or projects under the direction and supervision of a member of the women’s studies faculty.

**Prerequisite(s):** Admission to graduate program in woman's studies and permission of director.

**Notes:** May be repeated for a maximum of 9 credits.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 3-6

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**WMST 695 - Internship**

Credits: 3 (NR)  
Community or campus-based service or experiential learning related to women's or gender issues. Students develop, in consultation with a faculty member, individual contracts defining the learning and competencies they plan to gain from the experience.

**Prerequisite(s):** Completion of 15 graduate credits in Interdisciplinary Studies, including 9 credits in Women and Gender Studies or permission of instructor.

**Hours of Lecture or Seminar per week:** 3  
**Hours of Lab or Studio per week:** 0

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**WMST 699 - Capstone Portfolio**

Credits: 0 (NR)  
Prior to graduation and in consultation with their advisor, students will reflect on and synthesize their work in the women and gender studies certificate program by selecting three items taken from their work in the program and discussing these items in a 7-10 page essay. Work selected may include course papers, videos of their performances, exhibit photos, music recordings, and other items as agreed upon by student and advisor.

**Prerequisite(s):** Students must have completed their course work for women and gender studies certificate or be in the last semester of their course work.

**Hours of Lecture or Seminar per week:** 0  
**Hours of Lab or Studio per week:** 0  
**Grading:** Satisfactory/No credit only